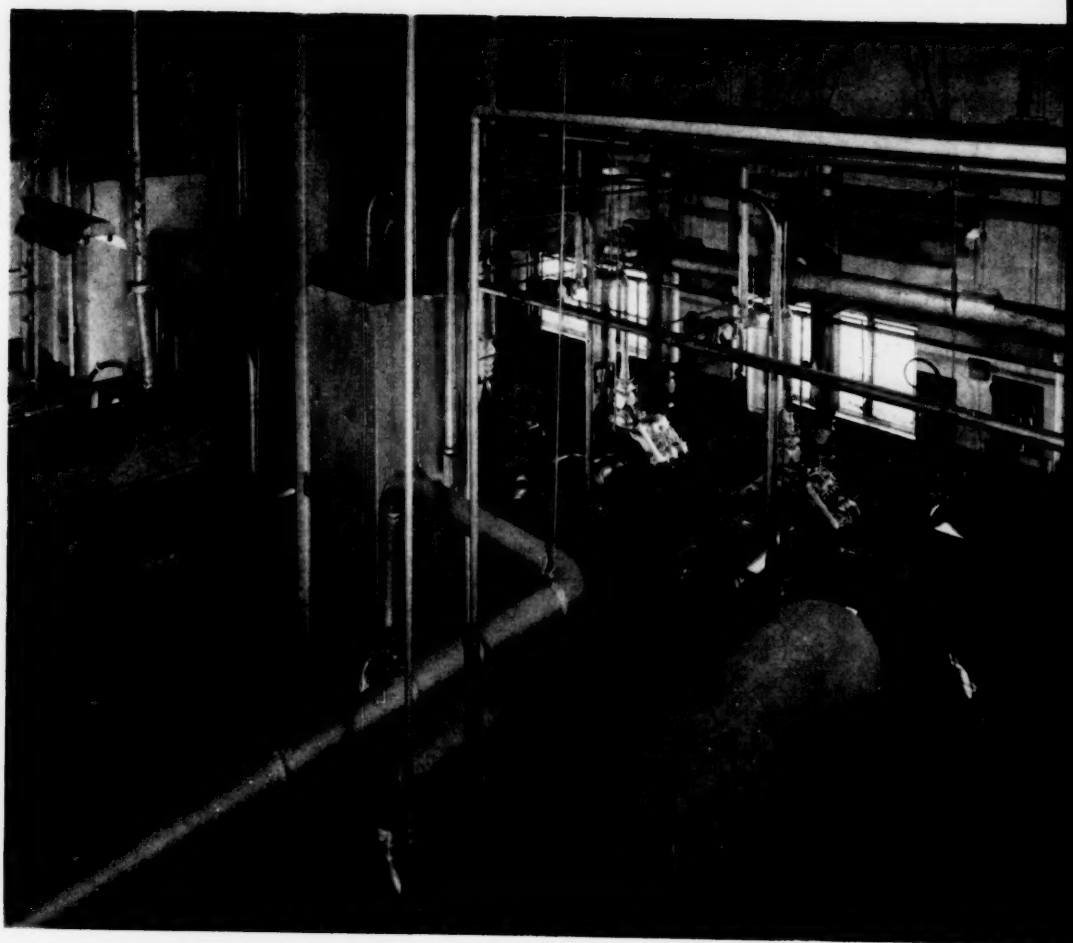
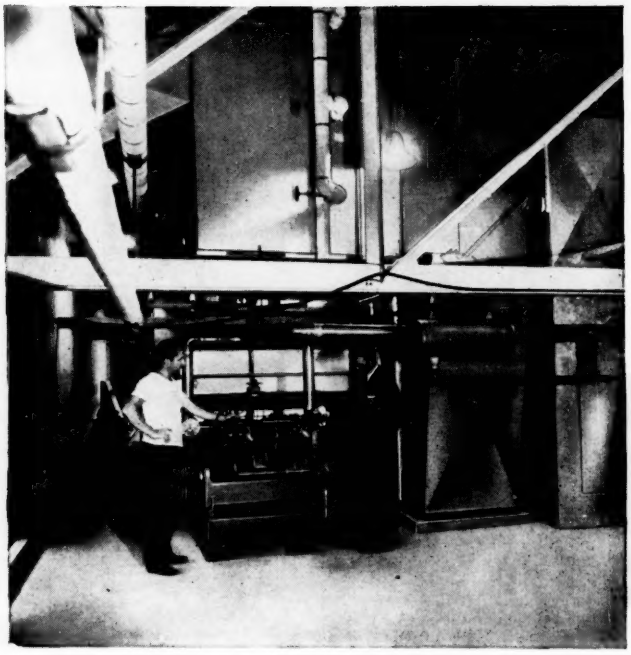
INDUSTRIAL REFRIGERATION

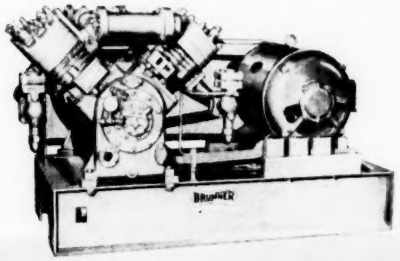


FOR THOSE BIG AIR CONDITIONING JOBS...

Compressors from the BIG BRUNNER LINE

BRUNNER SINCE 1906





LONG LIFE, RELIABLE OPERATION FEATURES OF BRUNNER COMPRESSORS INCLUDE:

- MOUNTING BASES CONSTRUCTED OF STRUCTURAL STEEL.
- LOW AND HIGH PRESSURE TYPE CONTROL.
- FORCE FEED LUBRICATION.
- PRESSURE RELIEF SAFETY VALVE.
- MODULATION AND UNLOADED START (optional).

Typical of the BIG air conditioning jobs where architects, consulting engineers and contractors have learned to rely on BRUNNER compressors is the new Bostitch plant in East Greenwich, Rhode Island.

75 HP compressors, 100 HP compressors—whatever the size requirement—there was a Brunner unit to satisfy the design conditions.

Rugged workhorses of the various air conditioning systems at Bostitch, these units are tied-in to Dunham-Bush evaporative condensers and serve ceiling mounted air handling units for the Stapling, Engineering and Drafting departments. They also serve Dunham-Bush multizone units for conditioning executive offices and cafeteria areas.

Select Dunham-Bush and Brunner for *single source service and responsibility.*

BRUNNER DIVISION
DUNHAM-BUSH, INC.
UTICA, NEW YORK

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AIR CONDITIONING • REFRIGERATION • HEATING • HEAT TRANSFER

WEST HARTFORD, CONNECTICUT • MICHIGAN CITY, INDIANA • MARSHALLTOWN, IOWA
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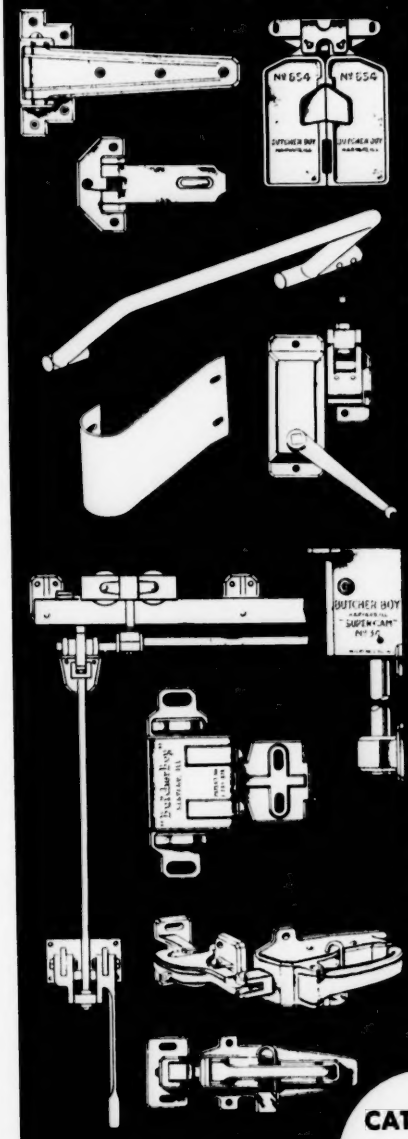
"Butcher Boy"
Since 1885

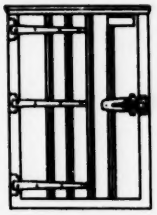
Refrigerator Doors

REFRIGERATOR DOOR
HARDWARE



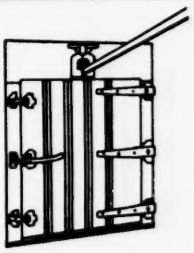
SAFETY RELEASE FASTENERS
No. 11 or No. 12
Permit opening from within even though padlocked from outside

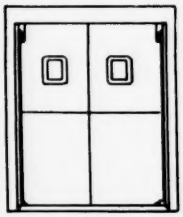
CATALOGS AVAILABLE UPON REQUEST



STANDARD COOLER-FREEZER DOORS

- Modern Streamlined Appearance
- 100% Douglas Fir Construction
- Massive and Durable Hardware



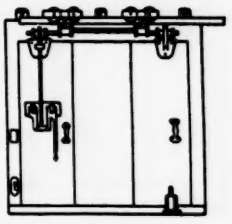


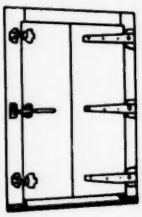
STANDARD VESTIBULE AND AUTO CLOSE DOORS

- Double Acting Doors for Loading Docks
- For Heavy Trucking Openings
- Save Refrigeration Losses

HORIZONTAL SLIDING DOORS

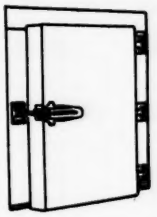
- Ideal where space factor is limited
- Recommended for Freezer Areas
- Available for manual, air, or electric operation
- Mechanically operated doors open and close in less than 4 seconds





LOW TEMPERATURE INFITTING AND SUPER FREEZER OVERLAP DOORS

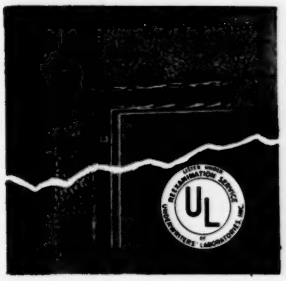
- Low Temperature Doors for +10 to —20° F
- Super Freezer Doors for —0 to —100° F
- Both types available with No. 51 electric defrosters
- Extra heavy duty hardware applications



New!

FULLY AUTOMATIC ELECTRIC DEFROSTERS

- Underwriter's Approved—An exclusive First with Butcher Boy
- Flexible "silicon" covered (not lead covered) heater cables
- Furnished with calibrated "thermostat"—economical heat control



BUTCHER BOY REFRIGERATOR DOOR CO. Dept. "MO" HARVARD, ILLINOIS

January—Bought ammonia from "X" who *promised* prompt dependable delivery . . .

Later—2nd ammonia shipment late, head pressure going down . . .

Still later—Had to remove ice cream to another cooling room . . .

Too late—No ammonia yet! 4 out of 8 cooling rooms shut down, ice cream ruined . . .

Be trouble-free—order only Armour Ammonia that's on time—every time!

You get service from 163 stock points and 8 bulk stations across the country when you order ammonia from Armour. Such service and consistent purity of 99.98% —on delivery—makes Armour your one best source for trouble-free ammonia every time. For further information, sulfur tapers and test papers, write us on your company letterhead.

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1353 West 31st Street • Chicago 9, Illinois

June, 1958

Number 6

Vol. 134

Industrial Refrigeration

Now in its 67th Year of Publication

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After some fifteen years absence the United States has again entered into relationship with the International Institute of Refrigeration through the good offices of the National Academy of Sciences.

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NARW initiates their economic research program and explains looked for achievements. The safest year on record is announced by the industry and next year's convention is slated.

Production Pioneers in Packaged Ice Cream 11

Florida's rapid growth as a dairy state is both attributed to the opportunity for modern dairying, milk processing and ice cream manufacturing techniques, and the new idea applications.

Automatic Defrost Systems 16

Continued from May issue. After listing five principal defrosting methods, the author chooses hot gas systems. Opportunities for improving both refrigeration system and defrosting method are discussed in this month's issue.

Hospitals Expanding Controlled Atmospheres 20

Fourth largest air conditioning activity is in the institutional field. Although the trend is to central station rather than unitary equipment, small hospitals step from latter to custom installation.

Central Condensing Serves Two Plants 22

Two production divisions for the larger retail food-chains utilizes a common engine room. Practical engineers touring the plant were impressed by the operation efficiency.

Construction For Meat Packers 29

Chicago meat packers operate hide association. Large ones decentralize, small ones multiply their operations.

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The Cover:

Pictured is compressor room No. 2 at Velda Corporation's Uleta, Florida, headquarters. The plant employs three-stage compression. Multi-cylinder high-stage machines are pictured. One of several rotary boosters is also visible in center background. Hurricane season and its general resultant, power loss, is made less of a problem by use of Diesel generators pictured in the immediate foreground.

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CATALOGS AND BULLETINS

Refrigerant Condensers

>> NIAGARA Blower Co. is offering Bulletins 133, 137, 138 and 139 on four new series of products. Respectively they are: coil surface type air conditioners, fan coolers, refrigerant condensers and vapor condensers. Equipment is fully described, illustrated, capacity curves provided, and tables of physical data included.

Air Handling Unit Motors

>> ADVANTAGES of installing motors inside the housing on air handling units has been published in a 10-point information capsule by Drayer-Hanson. The first of a series of manufacturers tips for engineers, the single sheet circular deals with safety, noise, maintenance and space saving factors of inside motor mounting.

Sure, we sell valves

. . . there are thousands of Hubbell-ized plants all over the world. But it isn't "plants" we serve . . . it's *people*. The human element is, and always has been, the most important part of our business. From castings to finished controls, everyone at Hubbell takes a personal pride in turning out the finest product possible. We'd much rather make lasting friends of our customers than just a few sales . . . *your goodwill* means a lot more to us than just a statistic or a dollar sign.

We'd like to prove it to you next time you need help in solving a problem in refrigeration controls.

E. B. LA PLANTE
GENERAL MANAGER

Hubbell CONTROLS

HUBBELL CORPORATION

MUNDELEIN, ILLINOIS

BACK PRESSURE REGULATOR VALVES • DUAL PRESSURE REGULATOR VALVES • AUTOMATIC SUCTION STOP VALVES • SOLENOID VALVES • GAUGES • SAFETY RELIEF VALVES

"Castings to finished controls . . . every inch HUBBELL!"

Engineering Manual Offered

>> PUBLISHED recently is a 16-page engineering manual on evaporative condensers by the Baltimore Aircoil Co. This book covers the theory and application of evaporative condensers, from their basic design through the installation and refrigerant piping hook-up. Numerous schematic drawings, charts, graphs, and tables illustrate the text. A copy of this booklet would be helpful to management, production supervisors and plant engineers alike.

New Volute Type Pump

>> BULLETIN NO. 1440 by Dunham-Bush, Inc. describes in detail their new type A5 centrifugal pump for horizontal or vertical installation. One page contains diagrams showing triple use for hot water, chilled water, or condensing water applications. Engineering data includes dimensions diagram, charts of dimensions data and maximum feet of water suction lift, rapid selection chart on page three, fitting data chart for pipe size, and a table of altitude and water temperature correction.

Air Condensing Literature

>> "UNICON For Unlimited Tonnage" is the title of Bulletin U-391 recently published by Kramer Trenton Co. The publication includes rating tables of systems from 15 to 540 tons, dimensional information, drawings of typical installations of particular interest to engineers and architects, performance data and simplified selection tables. Illustrations show the Kramer UNICON in an air-to-air heat pump application and its architectural integration into the design of a new and attractive building. Also offered is Bulletin CB276-C on Coil and Baffle Combinations of plastic-clad aluminum.

Pump Facts Booklet

>> GLASSED centrifugal pumps are covered in a new booklet jointly issued by Goulds Pumps, Inc. and Pfaudler Co., Inc. Thirty most frequently asked questions by chemical and process engineers are answered.

Pressurized Liquid Handling

>> JUST RELEASED by the J. E. Watkins Co. are Bulletin CC-1 and price list PCC-1 on their expanded cycle center line. A new unit combines compressor protection with subcooled liquid feed at constant pressure, and at constant suction temperature. A power saving example is cited and table of specifications for ammonia units is listed.

Waterproof joints are assured when you use Armstrong 520 Adhesive.
The cement forms a strong bond that resists deterioration with age.

520 Adhesive assures vapor-tight joints on Armaflex insulated lines

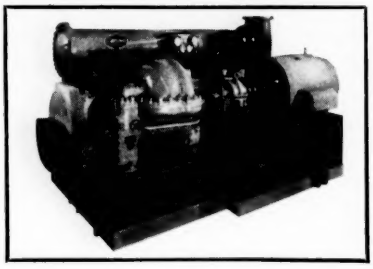
Fitting covers are no problem with Armaflex. They're quickly assembled from miter-cut segments, joined with 520 Adhesive.

Cold line insulation must be sealed tight against vapor if it is to stay dry and efficient in service. For a tight job, vaporproof Armaflex pipe covering should be applied with vaporproof 520 Adhesive. Its waterproof bond provides an excellent seal at all joints, grows stronger with time, and resists deterioration as it ages. 520 Adhesive is easy to use. A thin brush coat is applied to both surfaces to be joined, allowed to dry, and the surfaces are pressed together.

This adhesive is the only sundry material required for the installation of Armstrong Armaflex. No bands, twine, protective coatings, canvas, or cements are necessary. Fitting covers are made up from miter-cut Armaflex pieces, assembled with 520 Adhesive.

Full details on Armstrong 520 Adhesive, as well as Armaflex Pipe Covering, are contained in free descriptive folder. For your copy, write today to Armstrong Cork Company, 2206 Skye Drive, Lancaster, Pennsylvania.

Armstrong INSULATIONS

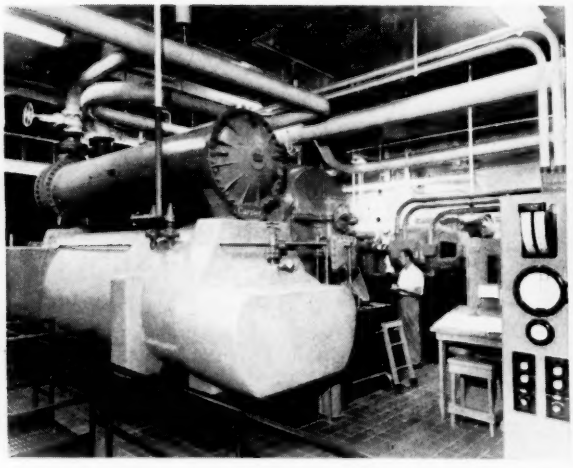


How Carrier Centrifugal Refrigerating Machines Meet a Wide Range of Industrial Requirements

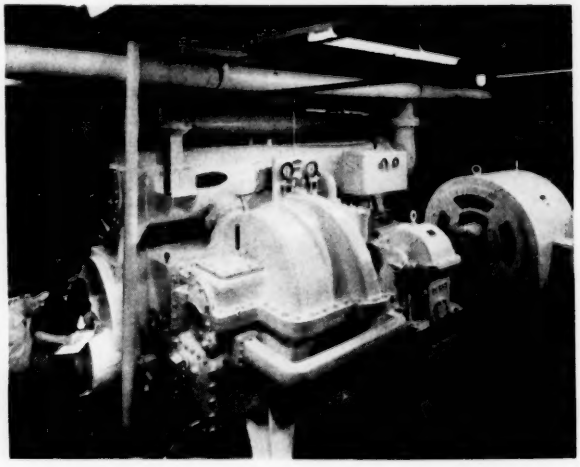
Since 1922, when Carrier developed the first Centrifugal Refrigerating Machine, Carrier has built and installed more of these machines for more purposes than all other makers combined. Over the years, Carrier has constantly refined and improved their design. You'll find thousands of them working around the clock, reliably and economically, in hundreds of installations. They are available in capacities to 3000 tons. Two typical applications are shown here—there are many more. Whatever your refrigeration needs, it will be worth your while to see how Carrier can serve them.

Call your nearest Carrier office. Or write Carrier Corporation, Syracuse, New York.

Carrier



Beverages: While Carrier Centrifugal Refrigerating Machines are used to chill all kinds of beverages, their greatest contribution in this field has been in breweries with the Carrier Ammonia Condensing System. This system liquefies ammonia right in the cooler of the Carrier Centrifugal without change of pressure. It permits perfect heat balance, eliminates flash gas, prevents oil circulation in the system and lowers costs.



Food processing: From manufacture of chewing gum to concentration and freezing of citrus juices, these machines are serving leaders in the field. Often the steam that is used for cooking or processing can also supply the energy for operating turbine-driven centrifugals. There is no low limit on the refrigeration temperatures. Air conditioning and process cooling applications can be served from the same machine.

news briefs of the month

Industrial Air Conditioning To Increase 20 Per Cent

Manufacturing, production and processing plants which are air conditioned are expected to increase 20 percent in 1958. Report by Freon Products Division, duPont Co., based on a survey just completed indicates only 12 percent of industrial establishments are wholly air-conditioned. Increase would amount to 1.5 million TR. The survey indicated only 19 percent of industrial establishments had been approached for air conditioning.

Another Service for Refrigerating Facilities

Several publications in Europe have reported that the British Oxygen Research & Development, Ltd., has introduced an idea of "freeze grinding" certain food products. High speed, fine grinding of some foods carries the risk of flavor impairment. Solid freezing of coconuts, almonds, etc. makes the product friable, after which grinding is carried out easily.

Dry Storage Warehouse Adds Refrigeration

Salt Lake City's Certified Warehouse and Transfer Co. has refrigerated storage space nearing completion. The addition will permit the firm to handle combined shipments of perishable and non-perishable food stuffs. Involving 60,000 square feet, it will be one level, rail and truck served.

Environmental Groups Elect Officers

Two-year old Institute of Environmental Engineers had its second annual meeting in New York City in April and elected Roger J. Amorosi, president and Harold C. Jones, executive vice-president. Other members of the executive committee are vice-presidents Arthur R. Billet, Robert L. Stallard, Bernard Friedman, Stephen D. Danko and past president Henry F. Sander. The Environmental Equipment Institute elected E. S. Brown, president, R. J. Jacobson, executive vice-president. George D. Wilkinson is general manager of both Institutes and Ray H. Mattingley is the editor of publications.

More Mechanical Cars For Northern Pacific

An order for 25 mechanical refrigerator cars has been placed with Pacific Car and Foundry Co. by Northern Pacific Railway. The 40-foot cars are scheduled for delivery in August. Coincidental with that announcement, North American Car Corp. of Chicago announced that freight car revenues were up. North American is reported as the third largest operator in this field.

ARI Elects

Elected president of the Air-Conditioning and Refrigeration Institute is D. V. Petrone, president, Typhoon Air Conditioning Co. Other officers elected at the annual meeting of the trade association are Vice-president, Rudy Berg, vice-president, Copeland Refrigeration Corp., Treasurer, L. N. Hunter, vice-president for Engineering and Research, National-U.S. Radiator Corp. George S. Jones, Jr., continues as ARI managing director.

Refrigeration Projects For British Columbia

Projects representing investment of more than $2.1 million were reported under way in British Columbia. Canadian Liquid Air Co. is replacing older facilities for manufacturing acetylene, refined oxygen, industrial oxygen and rare gases. Large tonnages of refrigeration and heat exchange equipment are involved. Next in capital investment comes the $200,000 addition of the Vancouver plant of the British Columbia Ice and Cold Storage. Industrial ice manufacturing is the biggest portion of this addition.

US Committee Now Established for IIR

▶▶▶ REFRIGERATION engineers and scientists of the United States have again become active participating members of the International Institute of Refrigeration. This announcement came recently from the National Research Council, National Academy of Science. A National Committee was named with one representative of the committee nominated by each of nine US groups participating. Dr. R. C. Jordan, Head, Mechanical Engineering Department, University of Minnesota, was appointed U.S. Committee Chairman.

One of the main objectives of the National Committee will be to work for active participation of the United States in IIR affairs. Functions are:
(a) Advising the President of the National Academy of Sciences on all international refrigeration activity.
(b) Promoting research in refrigeration in the United States with particular reference to those aspects which call for international cooperation.
(c) Nominating persons to serve as representatives to IIR meetings, and providing information for delegates.
(d) Arranging for Scientific meetings and congresses in the US.

Participating Groups include:
The Refrigeration Research Found'n.
American Society of Refrigerating Engineers
American Society of Heating and Air Conditioning Engineers
American Physical Society
American Society of Mechanical Engineers
American Institute of Biological Sciences
Institute of Food Technologists
Air Conditioning and Refrigerating Institute
Cryogenics Engineering Conference
All of the organized societies within the U.S. government.

In accordance with the Constitution adopted by the National Research Council, one member is nominated by each of these nine groups. Officers of the Committee shall be a chairman, vice-chairman, and secretary, all of whom shall be citizens of the United States and appointed by the President, National Academy of Sciences. In addition to Dr. Jordan, Chairman, Dr. H. C. Diehl, TRRF Director, Colorado Springs, was named Vice-Chairman. Dr. W. T. Pentzer, USDA, was appointed Secretary of the Committee.

Newly appointed commission offices of the US National Committee are as outlined in Table I.

"Historically", said Dean W. R. Woolrich, in recent correspondence with this publication on the IIR topic, "the staff of INDUSTRIAL REFRIGERATION have had great interest in the work of the Institute. In the earliest period of its existence the late J. F. Nickerson (founder of IR) was General Secretary of the American Institute of Refrigeration and continued at this post for many years. He was largely responsible for the success of the Third International Congress of Refrigeration held in the United States in 1913".

It is anticipated that another International Congress will be held in the United States within the next decade. Usually these international congresses are scheduled at four year intervals. The 10th International Congress of Refrigeration will take place August 29, 1959, in Copenhagen, Denmark.

The IIR is an inter-governmental body established in 1920. Set off by World War II disruptions, U.S. participation was discontinued for nearly two decades.

TABLE I—IIR WORK ASSIGNMENTS: THE INSTITUTE AND THE US NATIONAL COMMITTEE

Commission	Refrig'n Activity	IIR (Presidents)	US (Vice-Presidents)
1	Low Temperature	Professor A. van Itterbeck Univ. of Louvain Belgium	F. C. Brickwedde, Dean Coll. of Chem. & Physics Penna. State Univ.
2	Heat Transfer and Instruments	Prof. P. Laine, Director Refrigeration Experiment Sta. Bellevue, France	Prof. Carl F. Kayan Mech. Engineering Dept. Columbia Univ., N. Y. C.
3	Design	Prof. P. Glansdorff, Polytechnical Faculty of Mons University of Brussels	
4	Foodstuffs	Dr. J. Kuprianoff Res. Inst. for Food Preserv. Karisruhe, Germany	Dr. W. T. Pentzer Agricultural Mktg. Serv. USDA, Washington, D. C.
5	Cold Storage Ice Making	J.B. Verlot, Comm'l Serv. Nat'l Railway Soc. Paris, France	Paul Christensen, V. P. Northeast Cold Storage Co. Portland, Maine
6	General Applications	Prof. B. del Nunzio, Institute of Technical Physics University of Padua, Italy	Burgess H. Jennings, Dir. ASHAE Res. Laboratories Cleveland, Ohio
7	Land Transportation	Dr. D. Palmieri, former Director Experimental Inst., Nat'l Railways Rome, Italy	
8	Water Transportation	K. C. Hales, Technical Director Refrig. Cargo Research Council, Cambridge, England.	
9	Education	S. A. Anderson, Director Refrigeration Technical Inst. Copenhagen, Denmark	W. R. Woolrich, Dean College of Engineering Univ. of Texas, Austin.

Refrigerated Warehousing——

NARW Initiates Economic Research

Food Marketing Industries Cooperate with the NARW Economic Research Program: Seated, l. to r., Philip G. Kuehn, president, NARW, Charlie Jackson, National Fisheries Institute. Standing, l. to r., Wally Flint, National Association of Food Chains, Jerry Webster, National Association of Frozen Food Packers and Watson Rogers, National Food Brokers Association.

▶▶▶ OFFICIALLY inaugurating an extensive economic research program, Philip G. Kuehn, president, National Association of Refrigerated Warehouses, Inc., on May 2, signed a contract with the Midwest Research Institute of Kansas City. Inspired by a report of the Operations Research Committee at the Association's Annual Meeting in March, a program is being undertaken to determine the future position of the public refrigerated warehousing industry in the nation's food distribution pipeline. Rapid changes in food production, marketing and technology have had an impact on refrigerated warehouse operations.

A Business of Services

Service is the product which a warehouse has to offer and, according to Kuehn, warehousemen are interested in anticipating and keeping abreast of service facilities required to meet changing conditions in the field. Midwest Research Institute of Kansas City, a non profit organization, is devoted to basic research activities for numerous American business firms and organizations. It is estimated that the research for NARW, voluntarily subscribed to by its members, will be completed March 1959.

PR Facts, Secondary Aims

This research will develop certain incidental information such as that portion of the consumers perishable food dollar which is attributed to refrigerated warehousing costs. The industry itself knows this figure is infinitesimal, so small in fact that it never appears as a separate item in USDA studies of farm-retail price spreads. For example, the cost of storing a 6 oz. can of frozen orange juice is a very minute fraction of a cent per month. By determining definitely what the figure is, the refrigerated warehouse can more thoroughly document and substantiate the fact that although refrigerated warehousing is a vital function it is not an expensive one, nor does it represent an appreciable part of the consumers perishable foods dollar expenditure.

Safest Year Reported

▶▶▶ RELEASED early in May was the 1957 Safety Survey Report NARW, which showed the safest year on record for the refrigerated warehousing industry. Frequency of loss from accidents has been reduced by 25 percent and the severity rate is down 50 percent. A total of 67 plants, also a record number, out of nearly 200 reported not a single lost time accident.

NARW Safety Committee chairman and treasurer, A. R. Carstensen, commented that just six years ago NARW members took a look at their safety record and determined to bring it up to the high standards expected of a progressive and vital industry. The '57 report reflects the results of the continuing program.

Disaster Drills

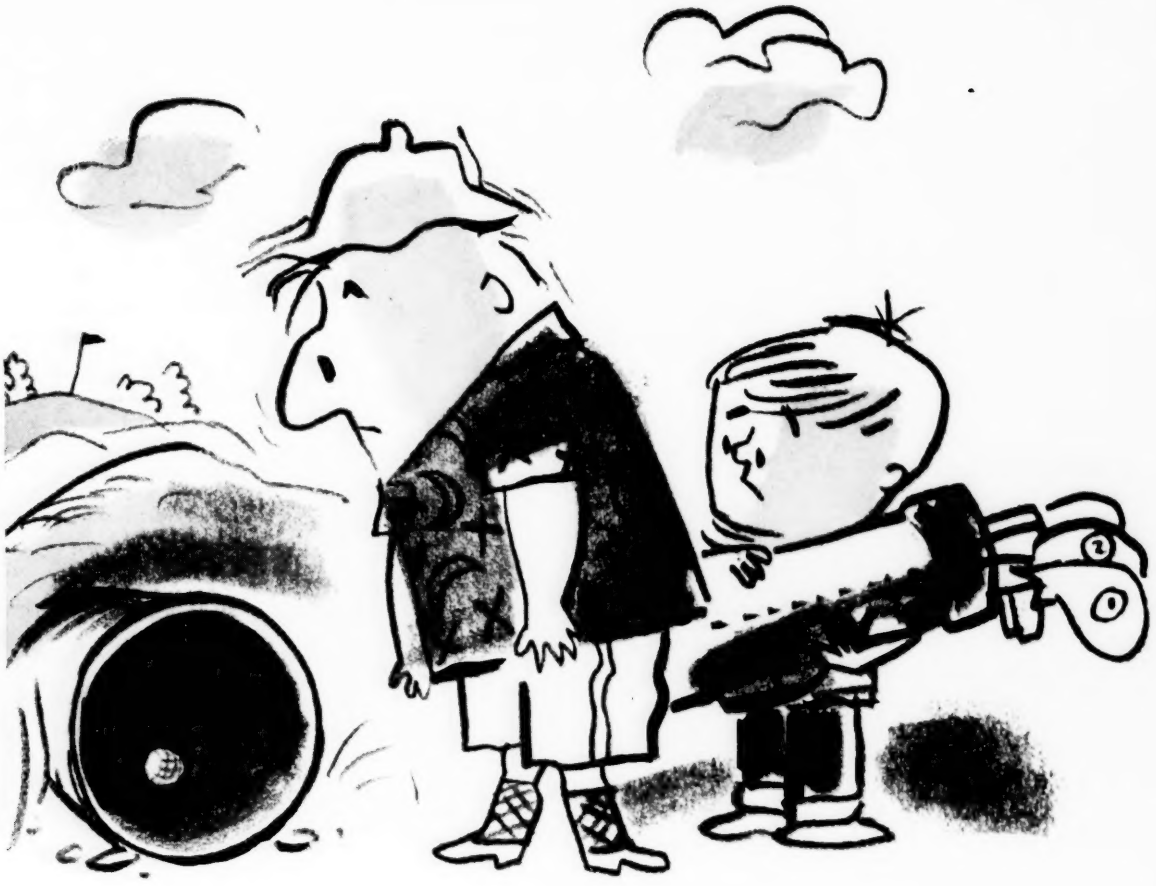
Proof of the committee's active work preceded the safety report in the form of a disaster bulletin over the by-line of R. W. Davis, a committee member. Headed "Speaking of Safety . . ." a 3-page release cited a couple of recent calamities in the industry and suggested to NARW members that they plan, prepare, and stage disaster drills. One example dealt with fire and the other a refrigerant break.

Training Programs

The bulletin listed five planning steps and then went on to point out a few simple preparations. Page 3 devoted to the actual staging of the disaster drill, pointed out that they should be held at regular intervals and that different disaster problems should be tackled periodically. It was pointed out that the disaster training may some day save lives and property and that the cooperation of the employees can be obtained if they understand that it will insure their own lives as well as those of other fellow workers.

Next NARW-TRRF Meet In the Nation's Capitol

▶▶▶ TIME and place of the 68th Annual Meeting of AWA has been established as April 5 to 9 (Cherry Blossom Time), in the Washington Statler and Mayflower hotels, District of Columbia. Arrangements for the 59th meeting had not been completed at the time of the Dallas convention last March and were announced late in April.



Some things are tough to get at...

The golfer in our picture thinks he has trouble. And he has. But his problem is nothing compared to the problem of the service man trying to get at the tough-to-get-at working parts of some makes of evaporative condensers.

Getting into most condensers for normal servicing of spray nozzles, and float valves for example, is not only tough but almost impossible. Even blasting doesn't provide adequate access.

But the situation is much different when a service man meets up with a Recold Dri-Fan Evaporative Condenser because it's designed with a preconsideration of the servicing requirements. With a Recold Dri-Fan the service man turns a few screws and then may actually GO INSIDE . . . and he doesn't have to be a midget to do it.

Because of design—with the service man in mind—drift eliminators on the Dri-Fan are easy to get at too. Remove the screws and the assembly slides out as smoothly as a built-in bread board in the kitchen. No gaskets. No sealing compounds. Instead—a patented access door that makes Recold's Dri-Fan the EASIEST-TO-GET-AT condenser—easy to service, easy to inspect.

Don't invest in a condenser that's tougher to crack than Fort Knox. Invest in the condenser that has everything PLUS ACCESS.

RECOLD CORPORATION

7250 East Slauson Avenue, Los Angeles 22, California

PRODUCTION PIONEERS IN PACKAGED ICE CREAM

Velda's Second Continuous Hardener Unit More Than Doubles Take-Home Packs

▶▶▶ INSTALLATION of a second continuous package freezer last June has helped Velda Corp. retain its leadership in Florida's quality ice-cream competition. The new hardener was designed and installed by Freezing Equipment Sales, Inc. of York, Pa. to handle ice cream from pint size to gallon packages. In 1950, Freezing Equipment Sales installed its first continuous hardener at Velda for the handling of pint packages of ice cream. Addition of the new hardener will more than double the quick hardening capacity of the Uleta firm's 140 odd item ice cream output.

Other modern processing, production, refrigerating and distribution methods are unique to Velda Corp.'s operations. Continuous liquid flow mixing of ice cream ingredients is achieved. Cones are filled and frozen in a blast tunnel, then coated automatically with chocolate and nuts. The ammonia refrigerating plant is triple-staged for most efficient heat removal. Upstate deliveries of product are by refrigerated railroad cars to re-distribution terminals further served by conventional routes.

Automatic Package Hardeners

Velda's new continuous hardener is tailor designed to fit their plant. Hardener complete with axial fans and cooling coil is located in a floor space measuring 9'-10" x 15'-0". Height of the tunnel is 19'-6" with loading and unloading mechanisms located on a mezzanine about 9'-9" above the main production floor. Ice cream hardener handles packages in continuous, straight line production from filling machines to stacking or palletizing. Packages are handled automatically throughout the loading, freezing and unloading operations. Thus, package rehandling and manual labor are eliminated.

The new Velda continuous hardener uses the same basic principle of conveying the ice cream through the low temperature air blast. Fig. 2 shows the package carrier assembly and loading table of the first automatic hardener installation at Velda. The carrier assembly, cooling coils and fans are enclosed by an insulated room (See Fig. 3.) Operating cycle of the freezer is shown in Fig. 4.

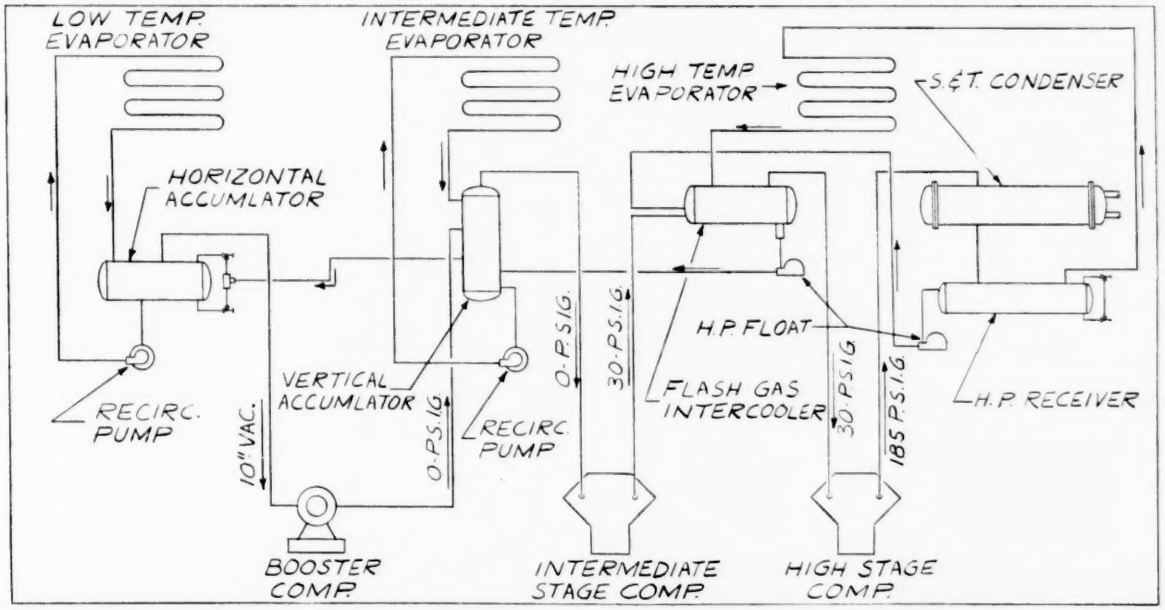


Fig. 1—Schematic of triple stage ammonia system with ammonia recirculating at low and intermediate levels, for most efficient service in the many temperature requirements of the modern dairy and milk processing plant.

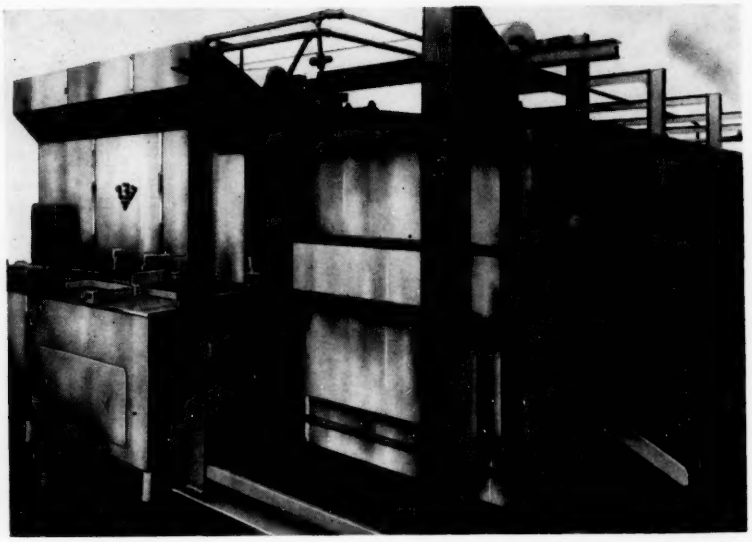


Fig. 2—Package carrier assembly and loading table for automatic hardener. Frame work pictured is actually contained in an insulated enclosure.

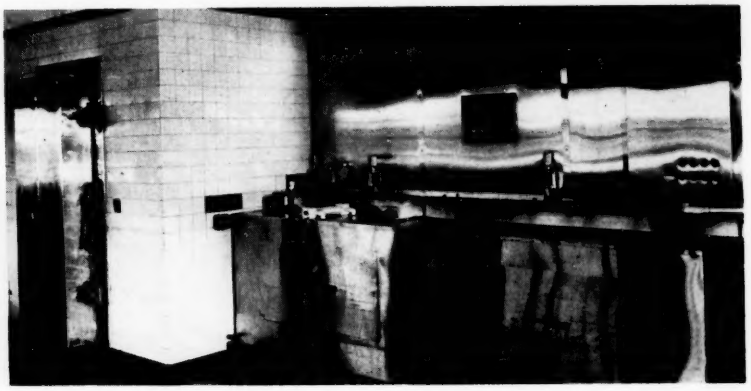


Fig. 3—Original hardener installed for Velda. The room at left contains entire freezing assembly while stainless equipment in foreground performs loading.

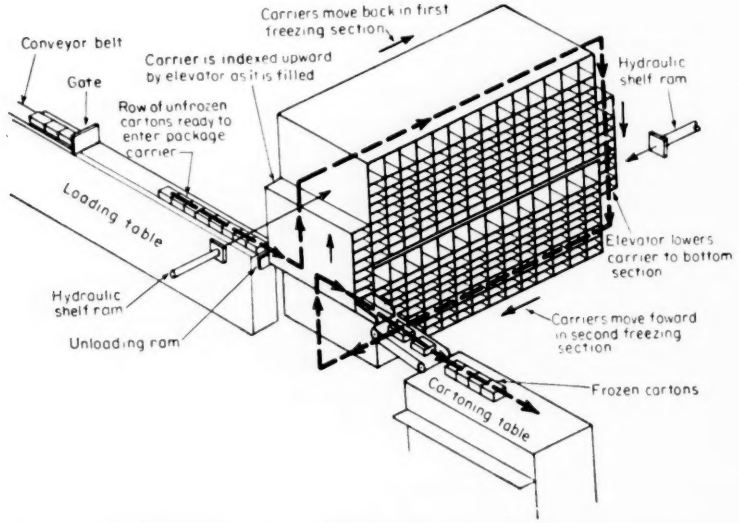

Carriers move back in first freezing section
Conveyor belt
Gate
Carrier is indexed upward by elevator as it is filled
Row of unfrozen cartons ready to enter package carrier
Hydraulic shelf ram
Loading table
Elevator lowers carrier to bottom section
Hydraulic shelf ram
Unloading ram
Carriers move toward in second freezing section
Frozen cartons
Cartoning table

Fig. 4—Isometric arrangement of the package freezers showing paths followed by cartoned product. Velda's second installation handles half-gallon sizes.

Essentially, this freezer consists of a honeycomb of cells filled with packages. This is accomplished by fabricating package carriers with multiple shelves, one above the other. There are 12 shelves per carrier on the original Velda pint hardener and 6 shelves on the new Universal Hardener which can handle an assortment of package sizes. Each shelf holds one row of packages. Air at 1,000 fpm velocity is circulated through this cell structure. The shelves and sides of the package carriers direct air movement, thus maintaining completely uniform flow through the freezing space.

A row of unfrozen cartons accumulates upon the loading table and is automatically placed upon the shelf of a package carrier in the loading station. Simultaneously, frozen packages are unloaded from the shelf below in preparation for reloading. Upon completion of both these operations, the carrier is raised vertically to load the next shelf.

This cycle is repeated until all shelves are filled. Then the carrier is raised to the top track and pushed one space to the rear of the conveyor. This pushes a carrier at the rear of the conveyor onto an elevator, which immediately lowers it to the bottom track. A pusher at the lower level moves all carriers on the bottom track one space toward the front of the conveyor, placing a new carrier in the loading station. At this point, the loading cycle starts again.

Operation and arrangement of the freezer has a profound effect upon the whole plant. In fact, layout of the ice cream manufacturing plant is determined largely by most efficient management of processing and freezing equipment.

Manual handling of product between the filling and freezing operations is eliminated to save cost and preserve quality. Rapid freezing is employed to maintain quality and save cost of valuable refrigerated space. Orderly frozen package discharge is assured at all times to prevent product damage and minimize labor required for stacking or palletizing operations.

Extreme compactness of this construction is illustrated by this installation in which 715 square feet of package shelf area is provided in a unit 15′ long, 9′-10″ wide, and 19′-6″ high. It is equivalent to 12 belts 6′-2″ wide and 10′ long. By contrast, a belt freezer 9′ wide and 80′ long would be required to provide an equivalent 715 square feet of package shelf area. This belt would require a room 14′ wide, 90′ long, and 7′ high without considering any space for the fans and the cooling coils.

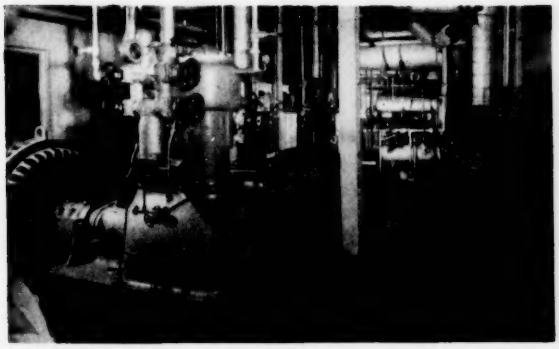


Fig. 5—Compressor room No. 1. VSA equipment and three multi-cylinder units are used on high-stage compression.

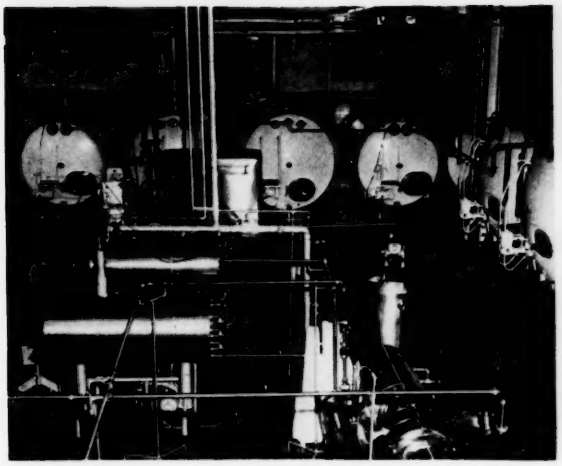


Fig. 6—Continuous flow mixing is achieved by Velda in this mixing and blending department. Pasteurizing, homogenizing and cooling of the mix are done here.

Uniform Air Flow

During product freezing, each package carrier shelf, as noted previously, is fully loaded. This prevents void spaces and presents a completely uniform pattern of air flow over the product. Package carriers are built to permit air flow along the sides of packages, as well as across top and bottom surfaces of the product. Thus, freezing proceeds inward from all sides of each package. The result—surrounded by a 1000 fpm blast of frigid air, the product freezes more rapidly.

Packages remain stationary on the carrier shelves throughout the freezing period. Their complete envelopment in cold air is never changed. Also, there is no product or package damage from constant sliding over metal surfaces.

All conveyor movements are hydraulically operated, with an electrical control system maintaining the sequence of movement. All parts in the freezer space are restricted to simple sliding motion, employing mechanisms unaffected by frost or low temperature.

Refrigeration is provided by banks of spiral finned coils mounted adjacent to the conveyor. Coils are arranged for hot-gas defrosting. Air circulation is maintained by axial-flow fans mounted between the conveyor framework and the coils.

Three-Stage Compression And Ammonia Recirculation

Since Velda's refrigeration needs were as varied as could be found in any milk and ice cream plant, the firm's consultants and own staff decided to multi-stage and to circulate liquid ammonia. Most efficient heat exchange would be derived by such planning, and compression ratios would be held at a point where large electrical horsepower drives would require the least amount of kilowatts.

Low Temperature Service

As indicated in the schematic diagram (Fig. 4), the low temperature (first stage) evaporators are serviced by a re-circulating pump drawing from a horizontal float-fed accumulator. Gas returning from the hardener units and the cone blast tunnel served by this recirculating system, is taken from that accumulator at 10-in., vacuum (minus 42F) to an FES-Fuller booster. This rotary discharges into the second or intermediate stage (low side) accumulator. Both accumulators are located in the ice cream storages. Since the low pressure vessels are remote from engine room, ammonia liquid levels are indicated in the operating area by oil actuated gauges.

Intermediate Service Range

Evaporative surface in the ice cream storage rooms, and the eight ice cream freezing machines are connected to the intermediate or second stage (vertical) accumulator. Other equipment so serviced includes the 96-mold brine (novelty) tank and railway cars.

Gas from this intermediate re-circulating circuit, plus that from the rotary booster is drawn off by the intermediate stage compressors which are multi-cylinder types, plus another FES-Fuller rotary booster (see cover). Suction is at 0 psig (minus 28F) and discharge is at 28 psig (15F), to a flash gas intercooler.

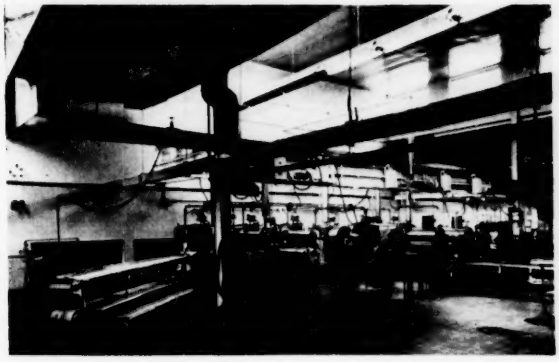


Fig. 7—From refrigerated storages, mix flows to the ice cream freezers pictured. Cartoning is also accomplished in this air-conditioned area before moving to hardener.

Fig. 8—Continuous quality control is maintained in this laboratory located between production areas.

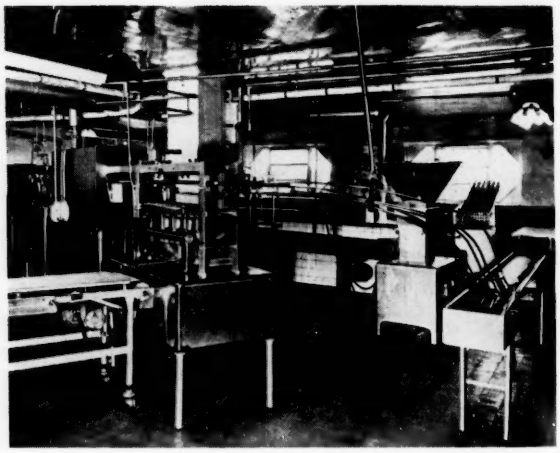


Fig. 9—Popsicles and other novelties are produced in this department which employs a 96-mold brine tank.

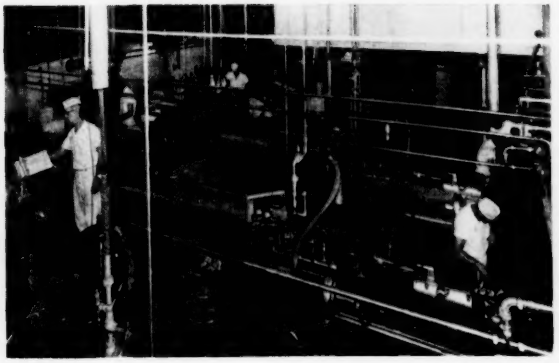


Fig. 10—Direct expansion refrigeration is used for cartoning machinery in the milk production room. Containers are fed into the machine, set up, filled, sealed and cased.

High Temp. Requirements

Outlet from high temperature applications in the plant, such as three ice builders, one two-stage plate cooler, nine mix storage tanks, two milk storage rooms, three bottle filling machines, and over a dozen refrigerated trucks (hold-over plate equipped), are led into the same flash intercooler. Suction from the flash gas intercooler enters the high stage compressors (shown in Fig. 5) and is compressed to 185 psig (96F). Condensing is by means of evaporative condensers (shown on roof in subject photo, page 11). Non-condensables are purged manually, from a vessel located in the cold storage room.

Liquid supply to various areas of the plant is as follows: High temperature units are served by liquid lines direct from receiver which feed various evaporators by thermal or float control, according to the device. Flash gas intercooler is supplied additional liquid thru a high pressure float valve with liquid pressure reduced to 28 psig. Resulting flash gas goes directly back to the high stage compressor.

Liquid to the intermediate stage re-circulating system and its accumulators is supplied by means of a second high pressure float valve. This float arrangement reduces pressure between the flash gas intercooler and the vertical accumulator, to 0 psig. Surplus liquid from the vertical vessel to the horizontal accumulator is supplied thru an oil actuated float.

Ingredient Handling

Mass or bulk production methods are a necessity in order to maintain low unit cost. Therefore, all ingredients are purchased in bulk quantities. Corn syrup is delivered in tank cars on the company sidings. Cane sugar is received in granulated form and reconstituted as a syrup. Other ice cream mix ingredients include dry powdered milk solids which are also reconstituted at the plant. Butter fat is added to the ice cream mix which is made on a continuous liquid flow basis, either as a 40 percent fluid cream or an 80 percent plastic cream. The latter is mechanically added via the mix blending tanks. The blending tank receives all metered ingredients from which the mix flows to vacuum steam heaters, and then to the homogenizers. Fig 6 shows Mix Dept.; Fig. 7, the freezing and filling operations area.

Pasteurizing follows, with the mix cooled during the post pasteurization period in a two-stage (water-ammonia) plate cooler. Cooler is rated at 1,000 gal./hr. Ice cream mix then flows to refrigerated tank storages totaling 15,000 gallon capacity. Quality control is maintained over each step in both ice cream and milk departments (see Fig. 8).

From storage, mix flows also by stainless sanitary piping to eight continuous ice-cream freezers and filling equipment. Production handling of semi-solid and solids from that point on are by means of mechanically operated and gravity type conveyors such as pictured in popsicle department (Fig. 9).

Packaging materials in both ice cream and milk departments are handled from receiving docks to storage, and from storage to point of use, by powered lifts and some conveyor applications. Cased products, such as milks, creams, and semi-solid milk products are bottled or cartoned and conveyed mechanically (see Fig. 10).

Two refrigerated railroad cars are used to transport 10,000 gals. each of ice cream to Jacksonville, Tallahassee and Tampa on a regular weekly schedule. Other branches and intermediate points are served by insulated trailer trucks refrigerated with eutectic plates or trailer mounted refrigerating units (see Fig. 11). Refrigeration is supplied for eutectic plate freezing or pull-down, by plant-side ammonia connections. Retail deliveries are by trucks equipped with either hold-over plates or the low-pressure truck units.

This Is Velda's Life . . .

Pineapple freezing was the original objective of Velda Corp. Plantation Foods, its predecessor, was founded on a 400-acre pineapple plantation. In 1950, Arthur Vining Davis consulted with V. C. Patterson as to an ice cream factory possibility. (All fresh pineapples grown were being moved without benefit of freezing). By April, first ice cream production runs had been accomplished. Today Henry B. Pownall, formerly of York Corp., is now Pres., Velda Corp.

Expansion continued also in the parallel milk field. While the ice cream business mushroomed to cities like Jacksonville, Lakeland, Tampa, Daytona Beach, Orlando, Ft. Pierce, and Sarasota, the firm also marketed milk at Jacksonville in 1952. In 1954 a Miami milk operation was acquired and both expanded, while ice cream marketing was extended to Ft. Myers, Ocala, Live Oak and Panama City. In 1957 a central Florida cooperative was purchased to assure future milk requirements.

Field Trip Feature:

Arrangements are being made for a field trip to Velda Corporation on November 12, when NAPRE holds its 49th Annual Meeting at Bal Harbour, Florida. This announcement came right at press time from Charles W. Moneypenny, convention chairman for the engineers.

Homemade Hydro-Cooler

▶▶▶ RECENTLY the FARM JOURNAL carried a short article on how a Rhode Island farmer constructed his own brocoli hydro-cooler. Noting that without pre-cooling brocoli wilted almost before it could be retailed, this enterprizing truck gardener invested less than $500.00 in construction of a mechanism which will handle 125 bushels per hour.

The farmer is Herbert M. Chase, Jr. of Newport County, Rhode Island. Chase relates that the rig has been used for almost 10 years. As pictured, it consists of a tank for holding crushed ice and water, a 2 hp electric driven centrifugal pump and a frame construction through which two conveyor lines pass. Ice water is circulated at the rate of 500 gallons a minute and approximately 14 boxes of brocoli move through the hydro-cooler on conveyors in 7–10 minutes.

The hydro-cooler weighs less than 1,000 lbs. and is built on skids so they can be moved from point of harvest to storage in off seasons. Distribution of water over the product was accomplished by tray of predrilled Masonite.

Ice Cube Scholarships

▶▶▶ NOTING that sized ice has become a bigger and bigger commercial ice market, Carrier Corp. has recently initiated a Sales Incentive Contest on retail ice making machines. A full college education is the prize that has been announced for the winners. Placement of machines in restaurants and hotels is the objective.

A winner among the dealers and their salesmen will receive a $10,000.00 trust fund to be held at New York's Chase Manhattan Bank for any youngster the winner names, for use at any future date. The fund is to cover not only college tuition, but board, books, and fraternity or sorority affiliations.

Unit Ice Associations Have Conventions and Conferences Galore

▶▶▶ INDUSTRIAL and commercial ice associations at state and regional levels have been preparing for the 1958 season through their customary annual meetings and sales conferences from the Northwest to the Gulf, from Texas to Maine. The Northwest Association of Ice Industries wound up their annual meeting at Spokane, Washington on March 14. Albuquerque was the location of the Mountain States Association meeting in April.

The Georgia Southern Ice Exchange, Ohio-Indiana-Michigan, North Carolina, and Virginia associations held their conventions through March. The Delta States Ice Association held their annual meeting in the same period, and the Illinois Association of Ice Industries came in under the wire with an annual meeting and Spring conference on May 2.

Regional conferences have been sponsored by the Florida Ice Association in April at St. Petersburg, by Louisiana at Alexandria and by the Mississippi State Group at Granada. Missouri-Oklahoma-Kansas held a conference, and one day meeting of the New England Group was held at the Kenmore Hotel, Boston, Massachusetts on April 29. The latter conferences were all NAII sponsored.

In Texas, the Spring Sales-Management Meeting took place on May 9 and 10, preceded by a Texas Ice Day on May 2. Governor Price Daniel officially proclaimed May 2 as Texas Ice Day in recognition of this significant contribution the industry had made to the growth and development of Texas. In his proclamation he noted that the third ice plant in the nation was built at Jefferson, Texas 83 years ago. The Spring Sales Meeting was climaxed with the annual Hugh Drane barbecue at Corsicana.

Northwest Elects Burgess

Ray Burgess, Jr.

Raymond Burgess, Jr., Sales Manager, Rainier Ice & Cold Storage, Inc., is the new president of the Northwest Ice Association Industries. Vice President is Rollie Summerfield, Vancouver, B. C. and Secretary-Treasurer, Lu Marsh, Portland, Ore. Directors, in addition to the officers are: Jim Bennett, Tacoma, Wash.; Flav Croteau, Spokane; Ken Davidson, Portland; Bert Leach, Vancouver, B. C.; Bud Stone, Yakima; Bill Wilson, Victoria.

Lu Marsh, reporting on the convention stated it was one of the best the Northwest has had with regard to attendance, papers presented and discussions. In one remark he indicated that anything but optimism existed about the coming year's business. Lu reported the change is just about over in the swing from block to sized ice, except for car icing. Very little block form is used in the Northwest, but the demand for sized ice is growing.

Todd Heads Mountain States

Waldo Todd, Santa Fe Ice Co., New Mexico was elected President of the Mountain States Association. Vice-President is Henry Williams, Denver, and Secretary-Treasurer is J. Bruce Espy, also at Denver. Regional President, H. B. McCluskey introduced C. P. Austin, NAII who described in some detail the ice industry film which is being prepared. Some of his discussion centered on engineering research, financed by NAII, including the refrigerator car project, utilizing bunker icing and circulating fans.

At the Indianapolis joint meetings of Ohio-Indiana-Michigan Associations, the Ohio group elected E. J. Dager, Bucyrus Ice Co. as President. Vice-President is M. L. Ottman, Cleveland. Secretary-Treasurer is Elizabeth Shannan, Steubenville. President R. C. Muckerman, NAII, and Secretary C. P. Austin were both present for this Great Lakes Regional Conference.

Delta States Officers

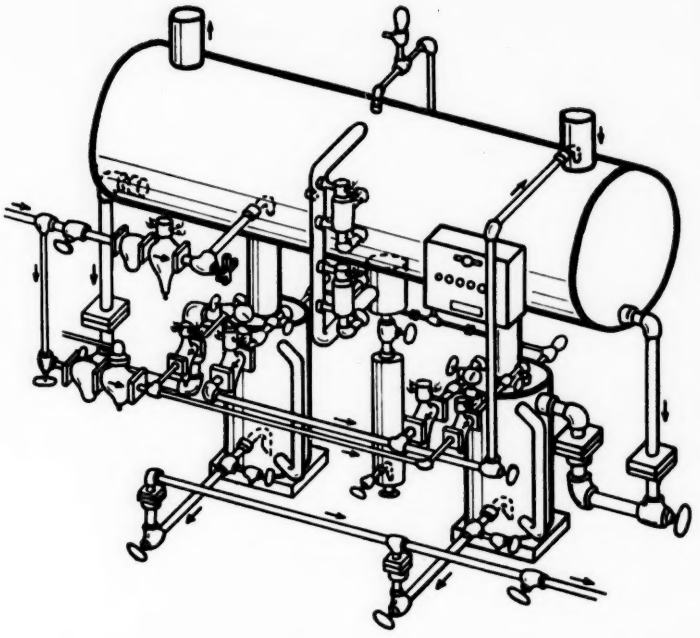
New officers of Delta States Association are: Vice-President A. P. Hernandez, Baton Rouge; Treasurer G. Thomas Fraser, Monroe; Executive Secretary, Mrs. Edna Vaughn.

The officers elected for the Southern Ice Exchange are: President W. L. Bell, Chattanooga, Tenn.; Vice President R. A. David, Jacksonville, Fla.; Executive Secretary Mildred J. Nichols, Bremen, Georgia.

The North Carolina Ice Association elected the following officers: President J. H. Lane, Charlotte; Vice President C. R. Zackery, Charlotte; Executive Secretary-Treasurer Lewis H. Powell, Raleigh.

Officers for the Virginia Ice Manufacturers' Association are: President C. N. Broaddus, Harrisonburg; First Vice President B. E. Butler, Richmond; Second Vice President H. A. Connell, Norfolk; Secretary-Treasurer H. H. Snyder, Alexandria.

Part II



Applications of Improved Auxiliaries Achieve Economical Frost Removal

By J. E. Watkins

AUTOMATIC DEFROST SYSTEMS

DEFROSTING reduces power cost while maintaining design capacity of refrigerating systems. Therefore it is desirable to defrost as frequently as practicable. Factors determining defrost frequency were cited in last month's installment. Part I listed in general the types or methods of automatic defrosting (see Table 1).

Having described the systems available, the Author went on to describe each, citing advantages and disadvantages. Indicating preference for the hot gas method, he then introduced some new hot gas developments and described applications to small plant systems. This installment continues the hot gas application—

For the Larger Plant

In the larger plant, many economies are made possible and desirable by the very size and multiplicity of the equipment — economies that might normally be difficult to justify in the smaller plant. In a freezer installation particularly, simplicity in layout can result in lowered first costs, reduced power and maintenance costs, and guarantees against compressor failure due to liquid slugs.

Fig. 5 shows a defrosting arrangement for a single evaporator which reduces the auxiliaries to the simplest essentials: a hand valve for setting and maintaining the liquid feed at a point which will guarantee considerable but not excessive overfeeds at all times, thus insuring full-flooding of the coil; solenoids in the liquid, suction and hot gas lines, and in a bypass line for conducting liquid out of the coil and into the suction line during defrosting.

A prewired control panel containing a time clock, a control relay and a room thermostat makes the system complete. Pilot lights in the secondary circuits of transformer type coils give definite indication of the valving operation and may be furnished in junction boxes at solenoid valves or on the control panel, or both. Since it is usually desirable to place the control panel outside the freezer space, lights in both places can be of great service in checking the automatic operation.

Maintenance Tool

A pressure gauge gives evidence of the correct or faulty performance of the valves and controls. Thus, when the time clock calls for defrosting,

TABLE I — PATENTED METHODS OF AUTOMATIC DEFROSTING AVAILABLE*

1. Prevention of frost accumulation by spraying the cooling surfaces with a brine or anti-freeze solution which is held to a constant strength by the continuous addition of heat to boil off the accumulated moisture.
2. The periodic application of heat electrically to warm up the cooling surfaces and melt the frost accumulation.
3. The controlled circulation of warm air from outside the freezer space and across the cooling surface.
4. The flooding of water over the cooling surface at intervals dictated by the rate of frost accumulation.
5. The use of hot refrigerant gas from within the refrigerating cycle.

*Scraping of pipe coils or other cooling surfaces is omitted since this discussion is confined to automatic defrost systems. Use of long pipe coils, bare pipe or finned, and plate surfaces in freezers is widespread. Problems involved in collecting and carrying off the water resulting, call for manual treatment.

Conclusion of a talk presented by J. E. Watkins at a joint meeting of ASRE-NAPRE, Pittsburgh, Pennsylvania, January 13, 1958. Subsequently the same talk was given by Watkins or his associate, R. B. Bass, at NAPRE Chapters in New Orleans, Kansas City, New York City, Detroit, Memphis and Green Bay. First installment was in May.

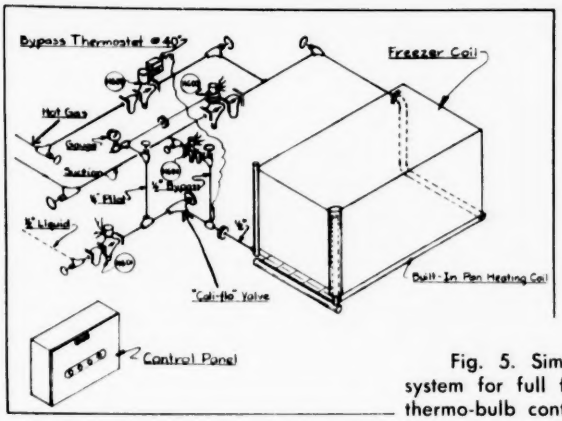


Fig. 5. Simple hot gas defrost system for full flooded coil. By-pass thermo-bulb controls hot gas supply.

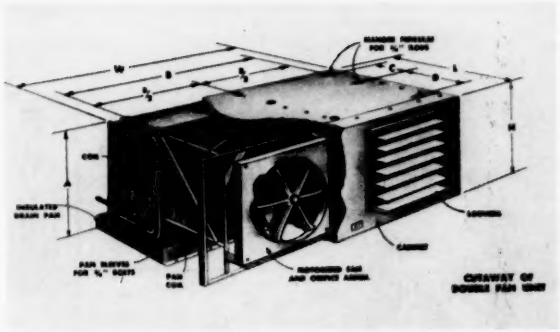


Fig. 6. This type blower coil design features a pan coil which receives hot gas first, assuring free drainage.

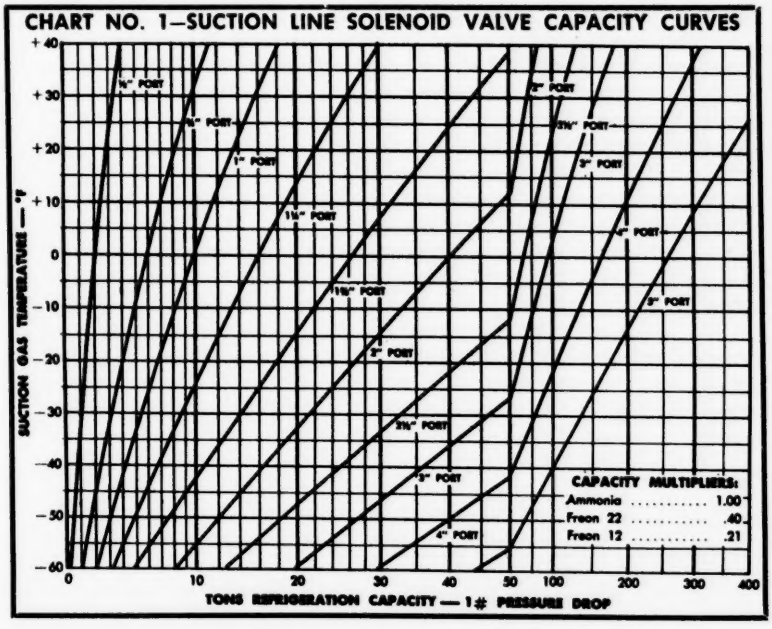
the liquid and suction solenoid valves are closed and the hot gas and bypass solenoids are opened. If the pressure in the coil does not rise at once, the service man or operator will be made aware of a leak or failure. This gauge is a small but very important maintenance check item in any automatic system.

By rapid removal of the liquid in the coil, the hot gas is brought into contact with the entire cooling surface, insuring speedy and complete defrosting. When the temperature of the bypass line rises to a preset point (usually 40 F), the hot gas solenoid is closed and the coil is allowed to settle down to suction pressure during the time remaining on the clock's defrost period. The fan is shut down, of course, during the entire defrost period.

Coil Defrost Feature

One freezer coil design (see Fig. 6) incorporates a pan coil into the coil proper in such a way that it is the first to receive the hot gas and thus guarantees a warm drain pan for the water as it falls off the coil. This pan coil—which is really the bottom row of the assembly—is used as cooling surface as well, so that no surface is used only for defrosting.

Freezer units of as high as 22 tons capacity are in operation on this hot gas system. Note that the headering arrangement made possible by the overfeeding of the coil reduces each circuit to only one row. As a result, pressure drops in the coil are held to practically the minimum required for gas flow, increasing mean temperature difference and therefore coil capacities.



Pressure drops are of extreme importance in any refrigerating system. In the case of low temperature equipment, excessive drops can be disastrous. A drop of one psi in an ammonia coil operated at 0 psig at its outlet, for example, will have temperatures of minus 25.6 F and minus 28 F at its inlet and outlet ends, a drop of 2.4 F. The same one psi drop at 11.7-in vacuum or minus 45 F represents a drop of about 3.5 F.

If the best is to be obtained from both freezer evaporators and compressors, then, a few dollars invested in the right components for the system may not only be fully compensated for elsewhere but may bring about very noticeable economies during the entire life of the equipment. Chart No. 1 shows what may be gained—or lost—in choosing suction solenoid valves.

Similarly controls which act to close off air flow or to cut out water sprays or fans upon fall in condensing pressure, are only increasing power costs in order to prevent coil starving. The latter occurs as a result of the use of obsolete feed devices. Constant liquid pressure maintained by a Cycle Center and the practically unlimited pumping action possible, make logical the use of a fixed orifice feed device at the evaporators. Calibrated hand expansion valves with only the initial setting required to overfeed the evaporator, are necessary in each case.

Compressor Protection

Liquid cannot simply be spilled out of a coil into the suction line without some means of evaporating it before it reaches the compressor. To have simplified the evaporator arrangement for defrosting only to complicate the balance of the plant is seemingly an engineering contradiction. However, providing the safeguards now necessary against slugging the compressor

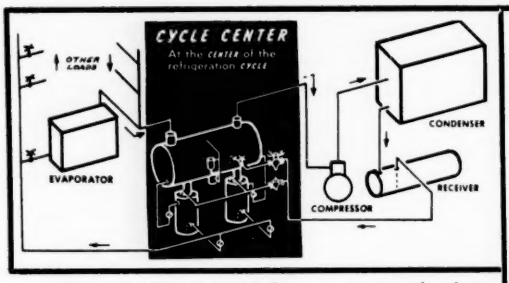


Fig. 7. Typical Watkins pressurized plant (containing cycle center) for single stage system.

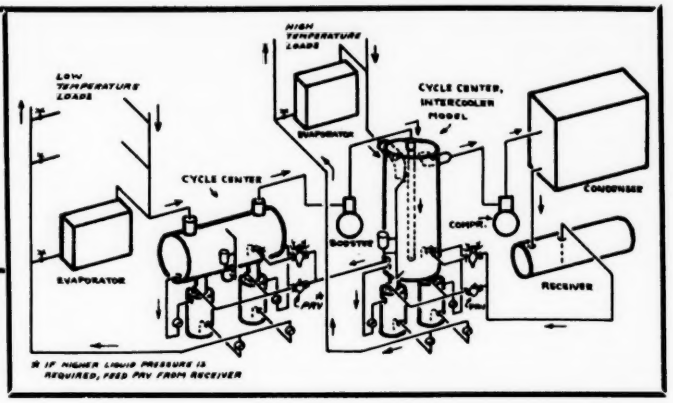


Fig. 8. Two cycle centers are applied for pressurizing the plant in a two-stage system, typical installation shown at right.

opens up possibilities of great power savings, perfectly safe automatic operation of the entire plant, greatly reduced first costs in new plants, and numerous other advantages which will become obvious to the reader.

Cycle Center Unit

Application of the Cycle Center to a typical single-stage ammonia plant is pictured in Fig. 7. Consisting of a suction accumulator and two auxiliary accumulators, this unit takes from the receiver what liquid is needed to maintain a low level in the accumulator, flashing the liquid down to suction pressure and removing the resulting flash gas directly to the compressor. In addition, the excess liquid from the evaporators is collected in the accumulator. The liquid (at suction temperature) is drained alternately and continuously into the two lower vessels or Pumper Drums and forced out into the main liquid line at a constant, predetermined pressure by flash gas obtained from the expansion of a small amount of the liquid through a pressure reducing valve. The liquid supply is thus maintained at a constant pressure the year around, at suction temperature.

Since 80 psig (53 F) represents a safe minimum obtainable from evaporative condensing equipment in the Chicago latitude (see Chart No. 2), the liquid pressure may be set at any point below 75 psig with complete assurance that the 5-lb minimum pressure drop will supply enough flash gas to do the pumping. With a plant operating at 25 psig suction, practically 50-lb liquid line pressure drop will then be required to show any flash gas at the expansion valves. Since such drops, due to line friction and static lifts, are rare (a 25-lb drop allows for a 90 ft static lift), the average plant will operate with liquid pressures at 25 to 30-lb above suction pressure.

As a result, it is possible to pump or recirculate many times the liquid evaporated while permitting the weather to provide large power savings by virtue of the reduction in condensing pressures to the lowest points obtainable without freezeup. This is in contrast to plants which maintain higher condensing pressures during the winter months in order to feed sufficient liquid through thermal valve or float valve orifices. The same principle holds true for air-cooled condensers.

Fig. 8 shows the application of the Cycle Center to the typical two-stage system. Conventional intercooler becomes a Cycle Center in order to recirculate liquid to the high temperature loads while removing superheat from the booster discharge gas. It also supplies liquid at intermediate temperature and pressure to the low pressure Cycle Center, in the standard arrangement. Where higher liquid pressures than intermediate are required, the liquid for supplying flash gas for pumping is taken directly from the receiver.

Liquid resulting from the hot gas defrosting of a coil has no effect on the Cycle Center. Such liquid results only in a somewhat higher than normal liquid level in the accumulator, closing off the level control and therefore the liquid supply. The pumping goes on at the same rate, the liquid inlet from the receiver remaining closed until the excess liquid has been evaporated.

New plants will require no receiver (see subject photo, page 16) since the Cycle Center accumulator, when made to receiver specifications, allows for the critical charging of the plant.

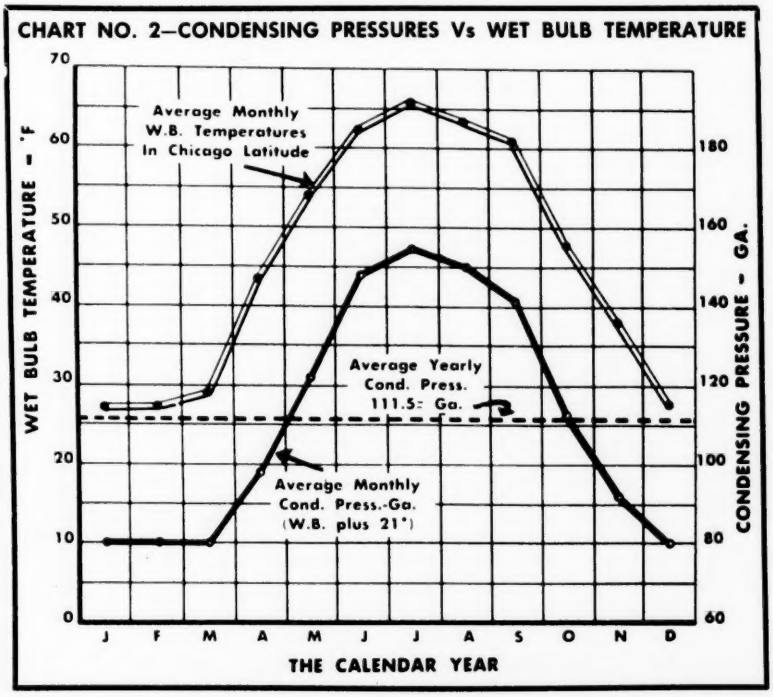
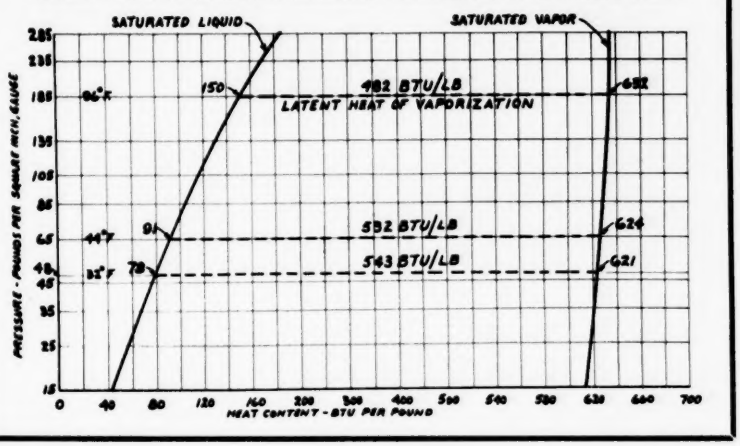


CHART NO. 3—PARTIAL MOLLIER DIAGRAM FOR AMMONIA



It is necessary only that the accumulator be made of sufficiently large volume to take care of the fluctuating levels and storage demands of the plant. In no respect does this differ from conventional receiver design.

Defrosting Pressures

Occasionally the argument is advanced that pressures of higher than 125 psig are required in order to supply sufficient heat for defrosting. Where such information originates is hard to imagine, unless it arises out of the need for larger hot gas supply lines, or failure to remove the liquid from the coil being defrosted, thus making of it a condenser coil.

Chart No. 3 is a partial Mollier diagram for ammonia. It is obvious from this reference that by feeding saturated gas at 185 psig to a frosted coil and drawing the liquid off as rapidly as it collects, 482 Btu are given up by each pound of ammonia. This amount may be increased somewhat if the liquid is cooled in the coil, to perhaps 500 Btu/lb. But with gas at 65 psig, the latent heat of condensation becomes 532 Btu/lb. Clearly the gas pressure has very little to do with the process, with the advantage actually on the side of the lower pressures. The problem, again, is to remove the liquid as it condenses.

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William P. Tennity, seated, President, Western Air Conditioning Industries Association, presents check to Dean Harold P. Hayes as Association board member Robert Savage looks on. Grant was made possible through the Association's Western Air Conditioning, Heating, Ventilating and Refrigeration Exhibit and is to assist with a new educational program instituted by the college to encourage more young people to enter the refrigeration field.

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HOSPITALS

EXPANDING CONTROLLED ATMOSPHERES

New 8-story wing of St. Boniface Hospital in Winnipeg, Manitoba. 5-story building adjoining new wing, far right, is one of the hospital's existing buildings presently undergoing complete modernization. Hospital will be among first in Canada air conditioned.

Air Conditioning at Peak—Mostly Step-by-Step Projects

▶▶▶ TWO YEARS AGO it was estimated that only two percent of the nation's hospitals were air conditioned. Today, two-thirds of the hospitals have entire air conditioning, conditioning of critical areas, or are planning to install some equipment for controlling atmospheric conditions, according to current surveys.

Hospitals having complete air conditioning are for the most part the more newly constructed. Only a few older havens have been totally conditioned. Most established institutions have been totally conditioned. Most established institutions have undertaken a step-by-step program starting with surgery areas. Larger newer hospitals and those undertaking step by step programs generally employ central station plants. However, smaller hospitals (less than 200-250 rooms) are generally employing window units.

Priority Areas

Operating, delivery, recovery rooms, are first consideration by hospital administrators. Controlled atmosphere in surgery areas, principally used as an explosive precaution, also aids the patient and provides some degree of comfort for medical personnel. Air conditioning in post-operative zones hastens the recovery in many cases.

Pediatrics, nurseries and maternity wards are usually second in the step-by-step air conditioning program. Third phase would apply air conditioning to allergy rooms, to general patient rooms and wards, and non critical laboratory areas. Last phase, of course, is to administrative and visitor areas.

Photo, Courtesy Carrier Corp.

Major equipment manufacturers who recently confirmed the surveys by medical journals, have reported the greatest growth of hospital air conditioning since 1950. One vice-president reports that the volume of orders for his firm is 64 percent ahead of a year ago. Approximately 17 percent of his company's annual production is supplied to medical structures, the 4th largest category of big air conditioning installations.

Planned In New Construction

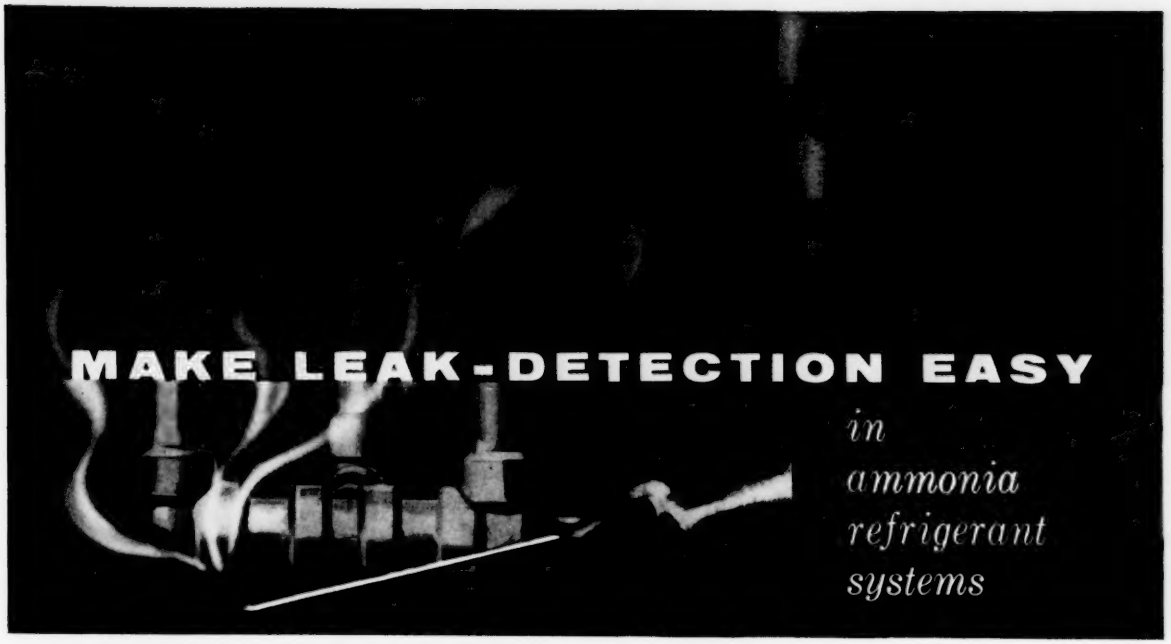
Among the new hospitals recently completed where the edifice has been entirely air conditioned are St. Boniface Hospital, Winnipeg, Canada, St. Vincents, Green Bay, Wisconsin, and Good Samaritan, Zanesville, Ohio. Bed capacity of each is 730, 437 and 291, respectively. Apparently northerly locations, where summers are short, and size of the hospital has nothing to do with meeting patient demands for air conditioning.

Step-by-step air conditioning applications have been made to such institutions as Mountainside Hospital, Montclair, New Jersey, where most critical areas have received first attention and the balance of the hospital receiving a controlled atmosphere system, according to a planned program. Presbyterian Hospital in Chicago is doing the job in stages. Over 900 tons of cooling capacity was installed in 1956. In 1958, an additional six floors will be completed.

By Increments

Typical step by step applications are also occurring at Asbury Park Methodist Hospital in St. Louis Park, Minnesota, Union Hospital, Elkton, Maryland and Sampson County Hospital, Clinton, N. C. Among some of the smaller hospitals installing room unit air conditioners for the comfort of the patient, are Northeastern Hospital at Philadelphia, and Memorial Hospital in Chattanooga.

Most reports contained some reference to conservation of engineering personnel in connection with the installation. Hospitals installing window units have indicated that an operating engineer was not necessary for their maintenance. However, the units were serviced on an outside contract. In the central station applications a number of the larger units installed supervisory control centers where one engineer can keep track of and manipulate equipment from the engine room console. A number of intermediate size installations were completely automatic, but a daily inspection was made by a maintenance man or by an outside service organization.



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Central Condensing Serves Two Plants

Lucerne Milk Division Safeway Stores Inc., Los Angeles ⟶

▶▶▶ AN INSPECTION tour of the combined refrigeration facilities of the Lucerne Milk Co. and Regal Ice Cream Co. divisions of Safeway Stores, Inc., was on the program for Los Angeles NAPRE Chapter last Fall. It was first of several such tours in the 1958 program, considered by many to be the most interesting and educational of tours sponsored in recent years. Members and guests were met on the Lucerne loading docks by Chief Engineer Walter F. Van Selow who, with members of the Safeway, Lucerne and Regal staffs, served as guides for the plant tour.

Both plants are new from the ground up and were placed in service only a few months before the NAPRE group inspected them. A common compressor room of over 1500 hp provides refrigeration for both the milk and ice cream plants which adjoin each other on So. Boxford Ave.

Tour of the facilities was in three parts, with tourists divided into three smaller groups for convenience: (1) inspection of the Lucerne milk plant; (2) the compressor department which supplies both plants with refrigeration; (3) a trip through the adjacent building of the Regal Ice Cream Company. Stops for explanatory comment included the following departments: milk receiving room, pasteurizing room, bottling department, maintenance shop, dry storage department, boiler room, compressor room, cooling towers, ice cream freezing tunnel, ice cream mix and boxing department, and ice cream supply warehouse.

Milk Product Demands

Chief Engineer Van Selow explained that refrigeration is required in the milk production division for four 10,000 gal. milk holding tanks, two 3,500 gal., three 1,000 gal., and two 500 gal. process tanks, plus two plate coolers (see Fig. 1), four milk cartoning machines, and a 150,000 cubic foot milk vault. Each milk storage or process unit is equipped with individual back pressure valves, liquid solenoid valves, and/or float valves for proper temperature control. The milk vault Kramer units are automatically defrosted on a timed hot gas cycle.

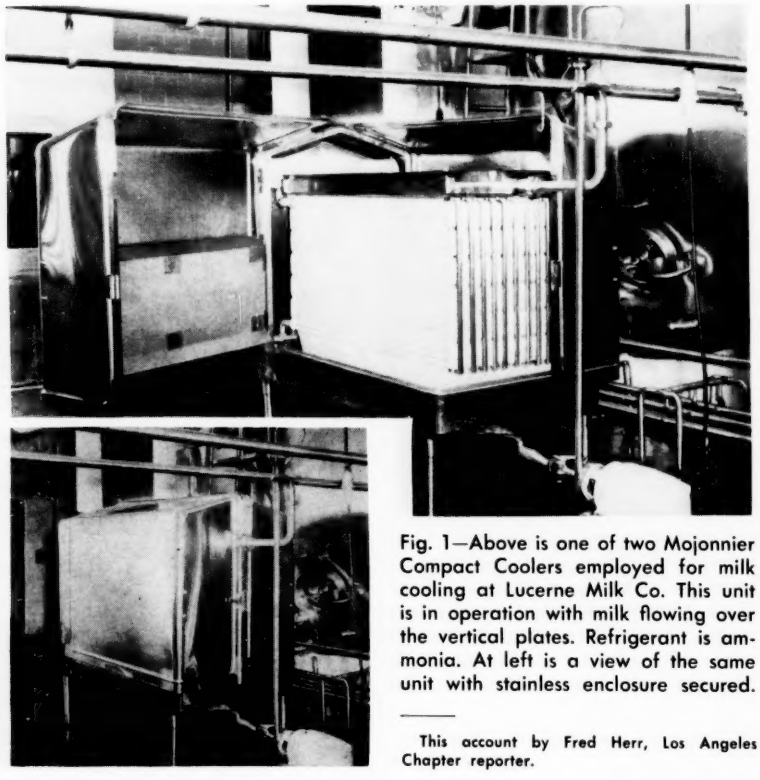


Fig. 1—Above is one of two Mojonnier Compact Coolers employed for milk cooling at Lucerne Milk Co. This unit is in operation with milk flowing over the vertical plates. Refrigerant is ammonia. At left is a view of the same unit with stainless enclosure secured.

This account by Fred Herr, Los Angeles Chapter reporter.

Central Condensing Plant

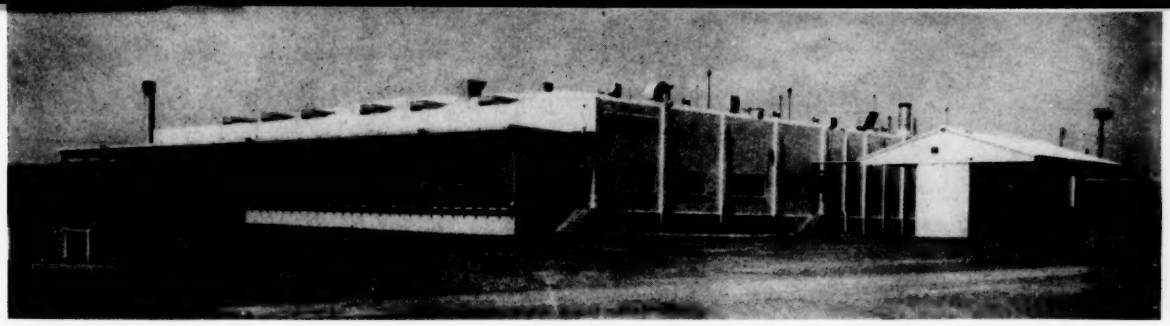
Compressor facilities are installed in a 50 x 50 ft refrigeration room in the Lucerne Milk Co. building, from which the refrigeration needs of the adjacent ice cream plant are also supplied. Refrigerating is accomplished by three basic systems: one single-stage low side and compression component for the Lucerne plant; one two-stage low side and two-stage compression arrangement for the Regal ice cream plant; and, condensing common to both. See Fig. 2.

The condensing system, Van Selow instructed, is divided into two operating levels of two steps each, or a total of four steps. Each step has a pressure switch in the common Lucerne-Regal discharge main, providing for automatic control. This is accomplished through electric drive manual or automatic selector switches provided. The switch for the first step (No. 1 condenser pumps) is set on "manual" position. The remaining three steps (No. 1 tower fans, No. 2 condenser pumps, and No. 2 tower fans) are set on "automatic". Tower fans are interlocked when on automatic control to the pump operating on that tower. Two water pumps may be cross-connected so as to operate as a single unit. Five 42-in. Diam. x 18-ft condensers, designed for 166 standard TR each or a total of 830 tons, are installed.

Milk Plant Compressors

Lucerne Milk Co. compressors and Regal Ice Cream Co. compressors are interlocked with the condenser pumps by means of recycle relays. On automatic operation this prevents a shut down of pumps when one plant or the other should go off the line.

Remember the handy "Genetron" JUG-A-LUG of



Lucerne Milk Company compressor nomenclature was given as (see again Fig. 2) two 8-cylinder York VW type, 6-3/4x5-in operating at 720 rpm, 20 F suction temperature and 90 F condensing to produce 190 tons each, using 195 bhp; two 16-cylinder York VW type compressors, 3-3/4x3-in running at 1170 rpm to effect 115 TR each, using 125 bhp. Although total capacity of the compressors is in the approximate vicinity of 600 tons, the plant was designed to have one 16-cylinder compressor as a spare or standby unit. Therefore 490 tons are available for continuous service.

Regal Ice Cream Co.'s compressor hook-up consists of: one eight-cylinder VW 3-3/4x3-in, 1170 rpm, at 20F suction and 90F condensing, producing 55 tons at 62.5 bhp; two 12-cylinder VW 3-3/4x3-in, 1170 rpm, producing 85 TR; one eight-cylinder (same as Lucerne units described which effects 190 TR). Totaling 415 tons, the Regal plant according to Van Selow, was designed to have one 12-cylinder compressor of 85 tons capacity as a standby. Continuous service capacity available, therefore, is 330 TR.

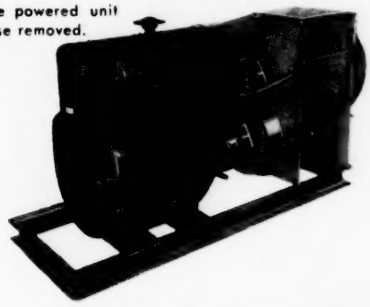
The ice cream plant's booster system consists of three Fuller-FES rotary boosters, type A-100, A-150 and A-200. The first is driven by a 60 hp motor at 1160 rpm. Type A-150 booster is driven by a 40 hp motor, and the type A-200 booster is driven by a 120 hp motor at 870 rpm. Conventional suction arrangements from trap, and discharge to liquid cooler are used. However, one unit is hooked up for triple-staging, taking suction from the ice cream freezer tunnel circuit. Liquid from trap, intercooler, and low pressure receiver is circulated to various evaporative applications by York liquid NH_3 pumps shown in Fig. 3.

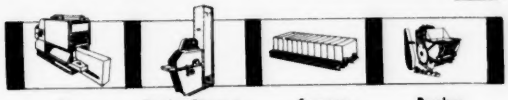
Capacity steps are numerous as some compressors are manually operated and some automatically, and all 12- and 16-cylinder machines have built-in capacity control. Eight-cylinder units are all "manual" compressors, and the 12- and 16-cylinder automatic compressors may be operated on manual by means of selector switches. See Fig. 4. Automatic compressor operation is by program relays.

The 16-cylinder compressors will operate at 25, 50, 75 or 100 percent capacity as suction pressures vary.

Electrically powered unit with flexible hose.

Gasoline powered unit with hose removed.





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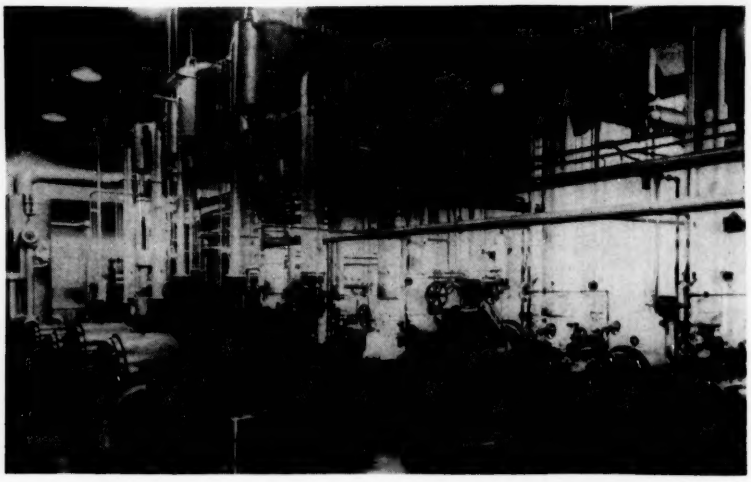


Fig. 2—Compressors for Lucerne Milk Division are pictured at left, those for the Regal Ice Cream Co. at right. Milk plant machines in the foreground are 8-cylinder units with 16-cylinder capacity automatically operated and capacity controlled units beyond them. Three rotaries are employed in a triple-staged recirculating system for the ice cream division. That system is also served by one 8-cylinder machine and the automatically controlled 12-cylinder capacity reduction equipped units in the right foreground.

The 12-cylinder compressors operate at 33, 66 or 100 percent capacity, and the FES-Fuller boosters operate either at 50 or 100 percent capacity. The two systems (Lucerne and Regal) according to Van Selow, each have a recycle program controller and time delay relays which, in the event of power failure, restart all needed compressors at intervals to prevent a power overload.

Continuous Belt Freezing

The hardening tunnel in the Regal Ice Cream Co.'s building is a continuous belt (woven wire mesh) affair, 46 ft long. It opens from the ice cream mixing, flavoring and packaging room. Liquid ammonia at minus 60 degrees is pumped through two spiral finned-coil evaporators by the liquid pumps. Design data, shown on Fig. 5.

Of the 65 TR/hr demand from the tunnel, the electrical load accounts for 15 ton and infiltration is one ton. In practice, ice cream mix enters the tunnel at 20 F. Experience thus far has shown the core is 18 F and shell at minus 5 F on half gallon ice cream containers. On pint containers the shell is minus 10 F, the core zero F when leaving the tunnel.

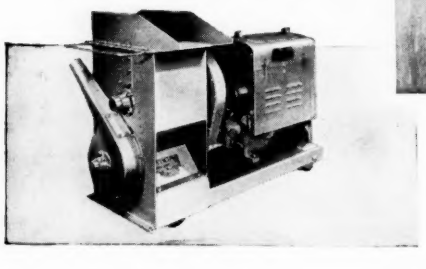
Here's how a LINK-BELT Ice Crusher-Slinger

opens new, larger markets for you

Top-icing is fast and effective

HERE'S extra profit for your ice service . . . helping shippers, wholesalers and warehousemen preserve perishables—in storage or en route. And a Link-Belt Ice Crusher-Slinger is your best means for getting your share.

These low-cost, efficient machines with capacities from 15 to 60 tons of crushed ice per hour . . . provide a slow-melting ice blanket that maintains correct temperature and moisture to keep perishables fresh. Link-Belt Ice Crusher-Slingers are available with gasoline engines or electric motors—in stationary or portable models. For facts, write for Book 2382 . . . or call your nearest Link-Belt office.



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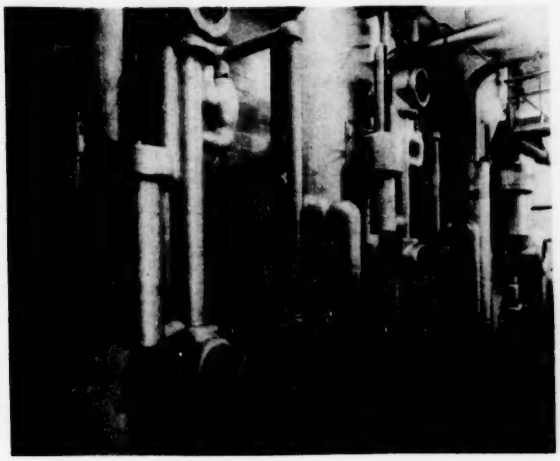


Fig. 3—Intercoolers and low pressure receivers together with their flow controls and liquid ammonia recirculating pumps keep a constant flow of liquid ammonia supplied to milk and ice cream plant equipment.

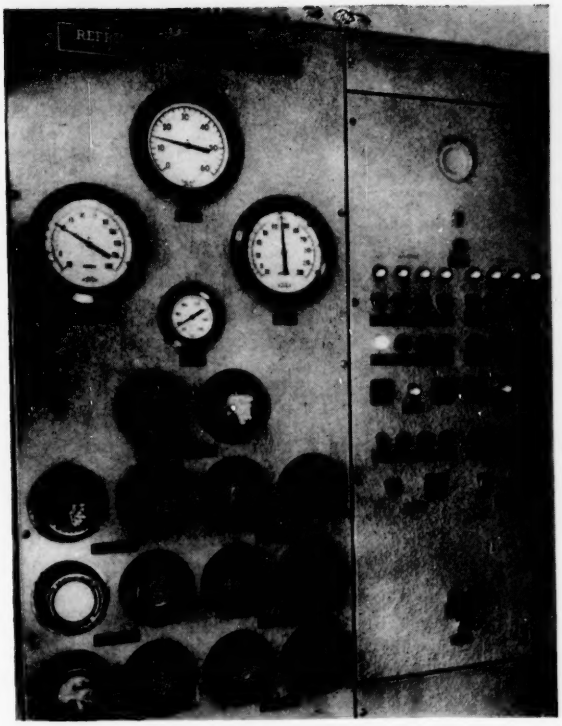
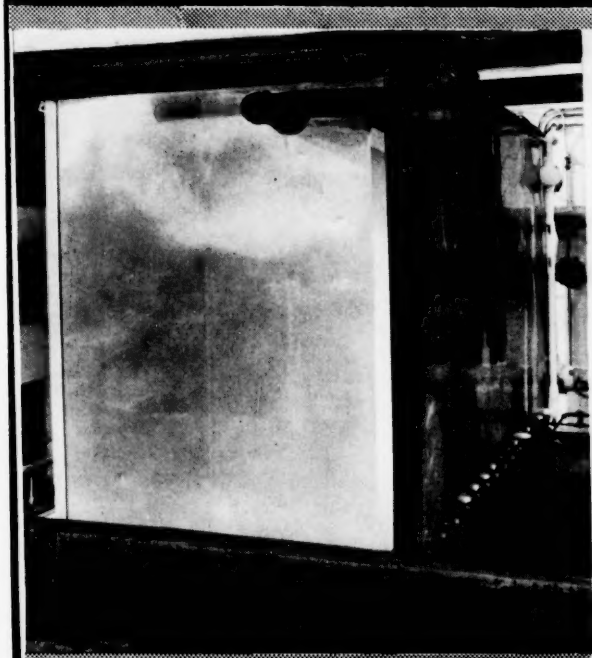


Fig. 4—Portion of the control board in the combined Lucerne-Regal compressor room. Large and small gauges in the center show condensing water pressure and temperature, respectively. Suction and condensing pressures are shown on the large dials, l. and r., respectively. The Mercoid switches serve as limit switches for the suction pressure control, cut-in and cut-out switches for condensing water pumps and cooling tower fans, and as low pressure and high pressure cut-outs for the four compressors.

You'll Never Lack for ICE WATER with the "KING ZEERO" System of Product Cooling



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Simple "King Zeero" design makes for efficient low-cost operation. Nothing to get out of order.

The value of "King Zeero's" is attested by the fact that after an initial installation, many companies have purchased additional units, like Ira Wilson & Son Dairy, Detroit, Michigan - illustration at left - with a battery of three interconnecting units.

You, too, can enjoy the advantages and profits accruing from the use of the "King Zeero" system of fast and economical water cooling.

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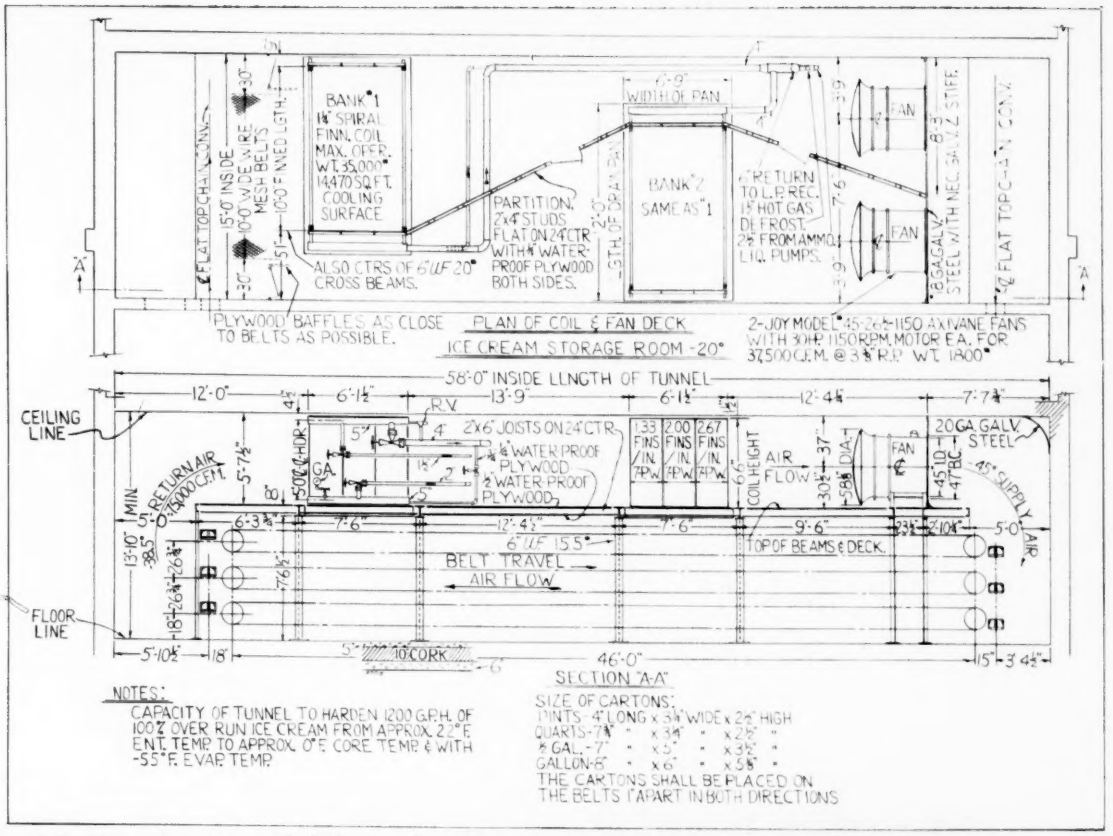
BANK #1 1¼" SPIRAL FINN. COIL MAX. OPER. WT. 55,000# 14470 SQ.FT. COOLING SURFACE
BANK #2 SAME AS #1
WIDTH OF FAN
FAN
FAN
RETURN TO L.B. REC. 1" HOT GAS DEFROST 2½" FROM AMMO. LIQ. PUMPS
PARTITION 2"x4" STUDS FLAT ON 24" CTR WITH ¼" WATER PROOF PLYWOOD BOTH SIDES.
ALSO CTRS OF 6"I.F. 20" CROSS BEAMS.
PLYWOOD BAFFLES AS CLOSE TO BELTS AS POSSIBLE.
PLAN OF COIL & FAN DECK
ICE CREAM STORAGE ROOM -20°
2-JOY MODEL 45-26-1150 AXIVANE FANS WITH 30 HP 1150 RPM MOTOR EA. FOR 37,500 C.F.M. @ 3½" R.P. W.T. 1800#
58'-0" INSIDE LENGTH OF TUNNEL
CEILING LINE
FLOOR LINE
RETURN AIR 15,000 C.F.M.
2"x6" JOISTS ON 24" CTR
¼" WATER PROOF PLYWOOD
2 WATER PROOF PLYWOOD
133 FINS /IN. 4PW
200 FINS /IN. 4PW
267 FINS /IN. 4PW
AIR FLOW
20 GA. GALV. STEEL
6"I.F. 155°
BELT TRAVEL
AIR FLOW
TOP OF BEAMS & DECK
SUPPLY AIR
10 CORK
46'-0"
SECTION "A-A"
NOTES:
CAPACITY OF TUNNEL TO HARDEN 1200 G.P.H. OF 100% OVER RUN ICE CREAM FROM APPROX. 22°F. ENT. TEMP. TO APPROX. 0°F. CORE TEMP. & WITH -55°F. EVAP. TEMP.
SIZE OF CARTONS:
PINTS - 4" LONG x 3¼" WIDE x 2½" HIGH
QUARTS - 7¾" " x 3¼" " x 2½" "
½ GAL. - 7" " x 5" " x 3½" "
GALLON - 6" " x 6" " x 5⅝" "
THE CARTONS SHALL BE PLACED ON THE BELTS 1" APART IN BOTH DIRECTIONS

Fig. 5—Drawing of continuous belt freezer for 1200 gph packaged ice cream, Regal Ice Cream Co., Los Angeles.

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VALVES AND ACCESSORIES FOR REFRIGERATION AND INDUSTRIAL APPLICATIONS

Chicago Packers Construct Hide Storage

»» RECENTLY completed in Chicago is a new curing and storage room for the Packers Hide Association. Installed in an old warehouse, the new facility affords curing and storage for a product formerly processed by individual packers. Objective apparent in the joint or associated hide production is long term savings to the packers.

Initial savings started with the construction. The method for applying the insulation effected almost 50 percent savings, through reduced material cost and approximately one-third of the labor effort.

Architects and engineers for the Packers Hide Association devised a method for applying the large sheets of Dyfoam insulation in a single layer to the underside of the ceiling joists in the warehouse structure. Interior finish for the insulation was Fire-Ban, a mineral surface coating applied directly to the surface of the Dyfoam. The storage room is held at 45-55 F by a refrigerating system engineered and installed by the Vilter Manufacturing Co., Milwaukee.

Consolidated Effort

Hides still account for a considerable amount of the profits which all forms of by-products bring into the annual report of the meat packer. However, rising costs in the preparation of marketable hides were reducing net derived. Further, curing and storing facilities at the individual packer were becoming obsolescent. Therefore, this group of Chicago packers formed a hide association, and pooled their operations. Consolidation of effort had the further advantage of releasing individual hide facilities to the more pressing expansion problems of each packer.

Material saving was accomplished in the storage room construction by elimination of 50,000 sq. ft. of conventional tongue-and-groove sheathing and 30-lb asphalt impregnated vapor barrier. Use of 2-in x 2-ft x 12-ft sheets of Dyfoam reduced the number of joints in the insulation to one-eighth the number involved with conventional 1x3-ft slabs. Elimination of the vapor barrier and sheathing on top of labor savings, is estimated as reducing overall cost nearly 50 percent.

The refrigeration plant is a Vilter single stage ammonia system. Three 4-cylinder VMC A434 compressors are suction pressure controlled to operate in a sequence starting and stopping arrangement. Room coils are of Vilter finned pipe arranged in sections which are such thermostatically controlled.

The evaporative condenser features water saving refinements; operates dry-coil to pre-determined head pressure, then water pump starts up recirculating cooling water over condenser coils. The machinery room also contains an H. A. Phillips Co. type A212 gravity flow liquid return system. The refrigerating system is approximately 100 tons.

Meat Plants in the News

»» CONSTRUCTION of a meat packing plant in Wilson, North Carolina, was announced earlier in the year by Swift & Co. Expected to employ between 200 and 300 workers, it will be Swifts first meat packing operation in North Carolina.

E. W. Kneip Inc. announced recently that they had taken control of the Burnidge Bros. slaughtering plant at Elgin, Ill., to be known as Kneip Packing Co. The Elgin plant is the third establishment by this firm.

IN STOCK...*New* BALL VALVES
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All refrigerating engineers are invited to affiliate with the National Association of Practical Refrigerating Engineers, Inc., an educational association, "not-for-profit".

From the President's Desk

Urges Active Participation; Appoints Nominating Committee

▶▶▶ FOLLOWING long established precedent, in May your NAPRE president appointed a nominating committee for the Fall elections. Traditionally the nominating committee is chairmanned by the immediate past president of the Association. Therefore, Bert C. McKenna, Chicago, will head up the 5-man committee and four alternates.

Also a tradition in NAPRE is the use of at least two other recent past presidents as members of the committee. Leroy Etzel, San Francisco, and Regis Gubser, Los Angeles, next junior past presidents to McKenna, have been asked to serve on the committee. Ken M. Holaday, St. Louis, another past president and chairman of the Industrial Membership Committee, is the 4th appointee to the nominating group. Fifth appointee is Falconer Anderson, one of the founders of Olympia Chapter.

Being practical in more than name only, NAPRE executives in the past recognized the fact that oftentimes committee members are detained or unavoidably absent from the national meetings. Therefore a list of alternates are generally lined up for the nominating committee and briefed on the work of the committee in order that they can step in as informed substitutes. Alternates appointed for 1958 are A. E. Wegener, past national president, New Orleans, Clyde Dalton, past chapter president, Pittsburgh, R. A. O'Neill, past national director, Corpus Christi and Robert Seiden, chapter president, Tampa.

Committee Objectives

The purpose of the nominating committee is to save time for the delegates at the annual meeting, by selecting a slate of capable nominees who were previously interviewed as to their willingness to accept office. Chapters and members-at-large are urged to communicate with the chairman of the committee, or the committee representative in their area, and make recommendations for the various national offices and directorships. Where two or more equally qualified recommendations are made for a certain position, the committee will often present more than one name. Nominations are still open from the floor at the national meeting and other members' names can be placed in nomination at that time.

President Leonard Bedard of the George B. Bright Chapter, recently circulated to all members of that Michigan group, a folder circulated to various organizations. This Christopher News Notes contained some excellent suggestions which could be applied to NAPRE. They are particularly timely, in connection with our thoughts of nominations and elections:

Detroit Cites Literature

"All organizations are made up of human beings, and accordingly there is a constant tendency:

to lose sight of lofty objectives;
to get bogged down in trivialities.

". . . . your organization . . . . adds up to nothing more or less than one individual like you, over and over again. In short, **you** are the organization. What you do, or fail to do, can therefore help or hurt its worthy objectives.

"Because you, personally and individually, are so important, make it your business to:

Be more than a 'joiner'. Membership confers rights, but it also imposes responsibilities;
. . . recognize the importance of . . . personal participation; Think for yourself. Don't be a rubber stamp. Work for the best interests of the entire membership.

"It is up to the membership to elect leaders who are truly representative and to see that fair procedures are observed at all times. No one can do this for you. To ensure effective results, you must constantly protect your freedom of choice.

Encourage capable leaders to run for office. Back them when they are elected;
See that their responsibilities are properly shared;
Keep infusing new life into the organization by . . . . giving listless members a renewed sense of motivation as well as gently removing deadwood, self-perpetuating cliques, and those who seek personal privilege . . .

"See that national meetings get beyond the talking stage. Help to put into concrete application the principles for which your organization stands, and you will be surprised at the results."

Frank L. Chase

News Notes and Chapter Activities

Metropolitan New York Chapter Chartered

Hubert Hooper, (left) President, receives New York City charter from Erich B. Utescher, past president and national deputy, NAPRE.

Quaid Minich, (right) Secretary-Treasurer and founder of NYC chapter, receives citation from Hooper on behalf of charter members.

NEW YORK—First of a number of new chapters to be officially chartered for 1958 was the Metropolitan New York Chapter, NAPRE. Although the engineering group petitioned the NAPRE Board of Directors for a charter last Fall, like most chapters, New York held open their charter member recruiting period for a number of months. This enabled all prospects to be contacted at least once and offered a charter membership.

Past National President Erich B. Utescher served as NAPRE President Frank Chase's deputy and officially presented the New York group with the charter at a dinner meeting in the Sheraton McAlpin Hotel, March. Officers installed are President, Hubert Hooper, engineer, Merchants Refrigerating Co. Newark; 1st vice-president, Charles Larsen, chief engineer, Sheraton McAlpin Hotel, New York; 2nd vice-president, David Nelson, chief engineer, Merchants Refrigerating Co., Jersey City; Secretary-Treasurer, Quaid Minich, chief engineer, Seaboard Terminal and Refrigerating Co., Jersey City; Sgt.-at-Arms, John Pondish, Montgomery Engineering Co., Jersey City. Board of Directors of the new chapter, in addition to the officers, are Gus Beinert, operating engineer, Geigy Chemical Co., Ossining; Martin Schermer, custodian, Board of Education, New York City; and Al Bracuti, refrigerating engineer, Seaboard Terminal and Refrigerating Co., Jersey City.

Dinner Proceedings

Roast turkey dinner was climaxed by a dessert of flaming "cherries jubilee" by the chef of the Sheraton McAlpin hotel, who could not stand to see the engineers take the entire limelight. Second vice-president Nelson introduced Hooper as m.c. Hooper welcomed the group, briefed the history of New York City chapter and outlined aims and purposes of NAPRE. Erich B. Utescher was introduced, the m.c. recalling that the deputy had been active in NAPRE since 1925, serving on practically every committee and holding the office of National President in 1948. He is currently chairman publications committee.

S. Milton Rambo, member of the national board of directors, and President of the Southeastern Pennsylvania chapter was introduced. He installed the officers of the chapter. Industrial member Mrs. Alice Voss Gerstmayr recounted some of the past of NAPRE and voiced the hope that New York Chapter would be able to have a National Convention in the near future. Gustave L. Beinert was the only charter member remaining of a previous NY group. The balance of the evening was spent in dancing and table hopping.—QUAID MINICH

Oregon Petitions For Chapter Charter

PORTLAND—First official and full-fledged meeting of the revived Oregon chapter, NAPRE, was held at 7:45 pm. in Room H-118, Benson Technical High School, Portland. President pro tem Lynn Mills, a past national director of NAPRE, presided and conducted nominations and election of officers. Offices of president, secretary-treasurer, recording secretary and sgt.-at-arms received only one nomination, while that of the vice-president required a run-off.

Following that procedure, nominations were closed and the secretary was instructed to cast a unanimous ballot for the following officers: President, Curtis McKeeman, chief engineer, Terminal Ice & Cold Storage; Vice-president, Phill Williams, chief engineer, Capitol Ice and Cold Storage Co.; Secretary-Treasurer, Philip Gilmore, asst. chief, Northwestern Ice & Cold Storage; Recording Secretary, Jack Kertesz, operating engineer, Lucky Lager Brewing Co., and Sgt.-at-Arms, Neil Trammell, operating engineer, Alderman Farms Frozen Foods.

Oregon previously had a chapter located at Albany. However, it was discontinued in 1952. It had been very dormant prior to that for about a half dozen years following World War II. The new chapter locates in a highly active refrigerating center.—PHILIP GILMORE.

NEW!

Large Air Volume

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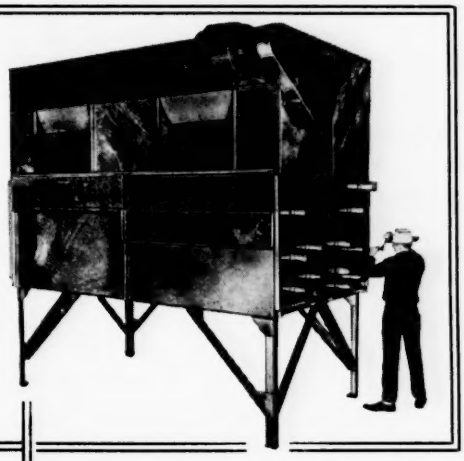

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ICE CREAM hardening rooms.

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Rugged construction throughout. Coils made of pipe—finned or bare, hot dip galvanized. Wide range of air volumes and capacities—from 31,000 to 75,000 CFM and from 18 to 84 tons. Can be engineered to fit specific requirements.

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Members-at-Large, NAPRE

NEW ORLEANS—Past National President Walter E. Bernd was pictured twice in a special edition of the Plattsburgh-Press Republican on Saturday, March 29. This distinguished member, formerly vice-president for engineering, Terminal Refrigerating and Cold Storage, Washington, D. C., has ben serving on the resident engineer's staff during the development of the Plattsburgh Air Force Base. The big Stategic Air Command base which has been built under the supervision of Area I, U. S. Army Corps of Engineers, is capable of accommodating huge B-47's and KC-97 Tankers. Price tag on the portion of the job supervised by the engineer team of which Bernd was a part, is $70 million.

W. E. Bernd

Canadian Heard From

Member John A. Vosburgh recently corresponded and excused himself for not keeping the Association abreast of his activities. His explanation was very adequate. Since 1955 his firm, Trans Canada Freezers, Ltd., has built five plants in Western Canada. He had become chief engineer of their Lethbridge, Alberta plant but last year was given the additional responsibility of refrigeration maintenance, installation and procedures throughout the system. His firm will open a new plant at Chatham, Ontario, on June 1 and he will therefore make his headquarters at Interprovincial Freezers, Ltd., Chatham.

New Englander Expands

Member-at-large Nevin W. Day, who operates a supply company in Hartford, Conn., under his own name, recently opened a similar enterprise in Boston, Mass. He has been in contact with members-at-large in Connecticut and Massachusetts to offer his services in connection with forming a New England, Boston, and/or Connecticut Chapters. Dealing in wholesale refrigeration and air conditioning equipment and supplies, Day represents NAPRE's Industrial Member, Recold Corp. In addition to that line he represents a number of control, tubing and flow equipment firms. Day is quite cognizant of the assistance that the wholesaler can render in organizing and establishing a chapter.

Goulding One Man Team

Member-at-Large Frank Goulding, Southwest Regional Manager for Cleaver Brooks, continues his one-man regional membership campaign through the states of Virginia, Georgia, Florida, Alabama, Mississippi, Louisiana, Tennessee, Kentucky, Arkansas and the Carolinas. He will even present the Emerson Brandt Memorial Trophy for President Frank Chase, to Greater Dade County Chapter for 1957 achievement.—J. N. MARIAKIS

New NAPRE Chapters Chartered

Southeastern Pennsylvania Enters NAPRE Family

LANCASTER—One year following an official meeting with the National Secretary, Southeastern Pennsylvania Chapter was presented with its charter. The affair was celebrated with a dinner presentation followed by entertainment and dancing at the Hotel Brunswick, national historical landmark. Erich B. Utescher, past national president, NAPRE, served as the installing deputy for President Frank L. Chase.

Officers of the new chapter installed by Utescher are President, S. Milton Rambo, supervising engineer, Consumers Corp. Lancaster; Vice-president, Charles Golin, Lancaster Packing Co.; Secretary, R. Vaughn LeFever, refrigerating engineer, P. Tassia Co., York; Treasurer, Melvin Burkholder, refrigerating engineer, Victor J. Weaver Co., New Holland, and Sgt.-at-Arms, Warren Tice, chief engineer, Lebanon Valley Brewing Co., Lebanon.

A number of out of town guests who were present included Hubert Hooker, president New York City Chapter and four other couples from that city. Four members of the Pittsburgh chapter who attended included past president Clyde Dalton, and secretary Otto Knoch.

Entertainment highlight of the evening was provided by John B. Shenk, lecturer and counselor on hypnosis and psychic phenomena at the Millersville State Teachers College. Chapter President S. Milton Rambo, a national director, was also presented with a citation by the membership of the new chapter in recognition of his efforts in their behalf.—JRK.

S. Milton Rambo, left, receives the Southeastern Pennsylvania charter from Erich Utescher.

Tom Dewhirst, left, receives Fruit Belt charter scroll from Bert C. McKenna, NAPRE official.

North Central Educational Conference Held In Michigan

BENTON HARBOR—Fruit Belt Chapter, NAPRE, chartering developed into a Regional Educational Conference on Saturday, April 26. Taking advantage of the close proximity of a number of NAPRE chapters, and following the suggestion of National President Chase, the new chapter invited members to attend a special morning and afternoon program. The chartering itself was accomplished at an evening dinner affair.

Opening the educational conference, chapter vice-president John Pfauth introduced Tom Dewhirst, founder and chapter president. Dewhirst welcomed the visitors from Wisconsin, Illinois, Indiana, Ohio and Eastern Michigan, described a bit about the fruit producing area and the economic contributions it makes. His talk also reviewed industrial refrigeration applications.

Following Dewhirst on the program was Prof. I. J. Pflug, Instructor in Agricultural Engineering, Michigan State University. The Professor's topic was "Immersion Freezing". Although most of the experiments and applications reported on were in the poultry freezing field, a considerable amount of discussion centered around the immersion freezing of fruit and vegetables. Later in the day at a Question-and-Answer session the professor discussed progress in controlled environment storage of apples.

Practical Anton Lorentz, engineer, Tony's Refrigeration, Kalamazoo, discussed a number of common operating observations which would make for more efficient refrigerating plants. He was followed on the program by Jerry Fisher, installation engineer, Hayes Bros., South Bend, who highlighted features of the new Southern Michigan Cold Storage.

Following luncheon, the engineers and guests in attendance toured the Southern Michigan Cold Storage plant. Following that planned inspection, an additional trip was made to the Sodus Fruit Exchange. The rather rapid growth of this area of the nation's fruit basket was reflected in the expanded refrigerating plant of this establishment in a period of 24 years. The plant has had seven additions or revisions and is undergoing an eighth addition at present. The new addition will provide special cooling facilities for handling cherries prior to canning or freezing.

The charter ceremony itself was under the direction of Bert C. McKenna, past national president and director of NAPRE's educational committee. McKenna had been deputized by President Chase for initiating the new members, presenting the charter and installing first officers. The officers of the new chapter are Tom Dewhirst, president, Lloyd Phillips, 1st vice-president; John Pfauth, 2nd vice-president, Dorr Dean, secretary, and William Knowlton, sgt.-at-arms.—JRK

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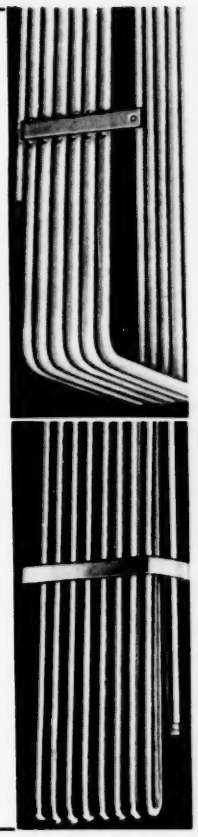

Little Giant Model 90M

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The Little Giant Line has a long record of service to many types of users. These breakers are designed to break ice in rice to chestnut to 3" size and pea to chestnut to 4½" size. Hand and power operated. Write for details and prices.

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BOOK REVIEWS

THERMODYNAMICS OF HEAT POWER. Revised edition. By Virgil Moring Faires, Professor of Mechanical Engineering, North Carolina State College. Published by The Macmillan Company, New York. Illustrated. 418 pages. Price $8.00. For sale by Nickerson & Collins Company.

The first edition of this book, under the title of Theory and Practice of Heat Engines was intended as a reappraisal of the contents of a short course. This edition has the same objective. The modern concept of thermodynamics as a logical and unified discipline has been adopted; and while this book contains adequate descriptive material, the major emphasis has been shifted toward the development and application of theory, especially as applied to steady flow systems. Students other than mechanical engineering majors were kept in mind in the writing of the book and it is intended to be interesting as well as instructive to them. There is a set of problems at the end of each chapter with the answers to nearly all of them. An index makes the contents readily available for reference.

THE FREEZING PRESERVATION OF FOODS Volume II. Third Edition, Freezing of Precooked and Prepared Foods. By Donald K. Tressler and Clifford F. Eves. Published by The Avi Publishing Company, Inc., Westport, Conn. 560 pages. Illustrated. Price Vol. II, $10.00 domestic; $11.00 foreign. Price for Vol. I and II, $28.00 domestic; $30.00 foreign. For sale by Nickerson & Collins Co., Chicago, Ill.

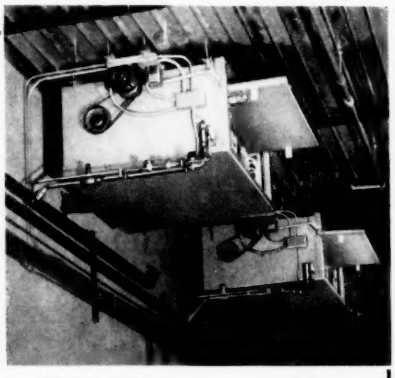
An entirely new book on the subject, Volume II is devoted exclusively to the production, freezing, packaging and marketing of baked goods, precooked and prepared foods. In the earlier edition only a single chapter was devoted to this phase of the subject. Since the principles and methods involved in preparing and freezing these goods are different from those followed in preparing raw or blanched foods for freezing, 24 new chapters have been devoted to a consideration of these problems.

A great variety of precooked and prepared foods are now frozen commercially. Complete information is presented in this additional volume on their preparation and freezing; also a chapter on refrigerated candies and other confections. This, and its companion book, Volume I (reviewed in July 1957 INDUSTRIAL REFRIGERATION) provides a comprehensive and up to date presentation of the techniques of this ever growing industry.

INTRODUCTION TO HEAT TRANSFER, Third edition. By Aubrey I. Brown and Salvatore M. Marco, Ohio State University, Published by McGraw-Hill Book Company, New York. Illustrated. 332 pages. Price $6.75. For sale by Nickerson & Collins Co., Chicago, Ill.

This book presents the fundamentals of heat transfer in a manner readily understood by third or fourth year engineering students. The authors provide a clear understanding of the principles, with a working knowledge of their application to a variety of engineering problems, providing a good foundation for advanced and more specialized studies in this field.

Two new chapters have been added: One on Fluid Flow in the Convection Process and one on Graphical and Numerical Methods for Heat Conduction Problems. There is also new material on Fundmental Units—intended to overcome difficulties which students have sometimes encountered because of confusion of force and mass units. A section on Design of Electrical Transformers is added.



Partial view of six Krack coolers installed by York Louisville Co.

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✳ Electric defrost—Warm air from electric heaters is recycled within the unit.

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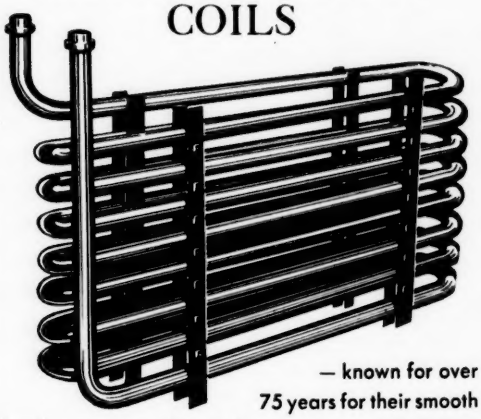

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TRRF on Humidity, Controlled Atmospheres

▶▶▶ UNDER "Basic Thinking", the TRRF Information Bulletin, April '58 carried comments on two subjects which were crowded out of the recent Dallas Council agenda. One was humidity measurements, and the other was controlled atmospheres.

Dr. W. H. Cook, National Research Council, Ottawa, Canada, raised the question on humidity, and pointed out that it might be advisable to direct attention away from the very difficult feat of measuring relative humidity in a freezer, and center attention on getting as close to 100 percent relative humidity as possible. He pointed out that it is well known that anything less than 100 percent is detrimental to freezer storage life. Therefore, he concludes, why is measurement necessary? Why not reserve research for remedying the situation by packaging, jacketed rooms, or humidification?

Inert Gas Control

The other topic is also raised by Dr. Cook wherein he pointed out that it has been 30 years since the Food Investigation Board of Great Britain established that controlled atmospheres were beneficial in some cases. He asks that if there has been any work done on inert atmosphere research such as nitrogen, rather than varying opinions on compounds of oxygen and carbon dioxide.

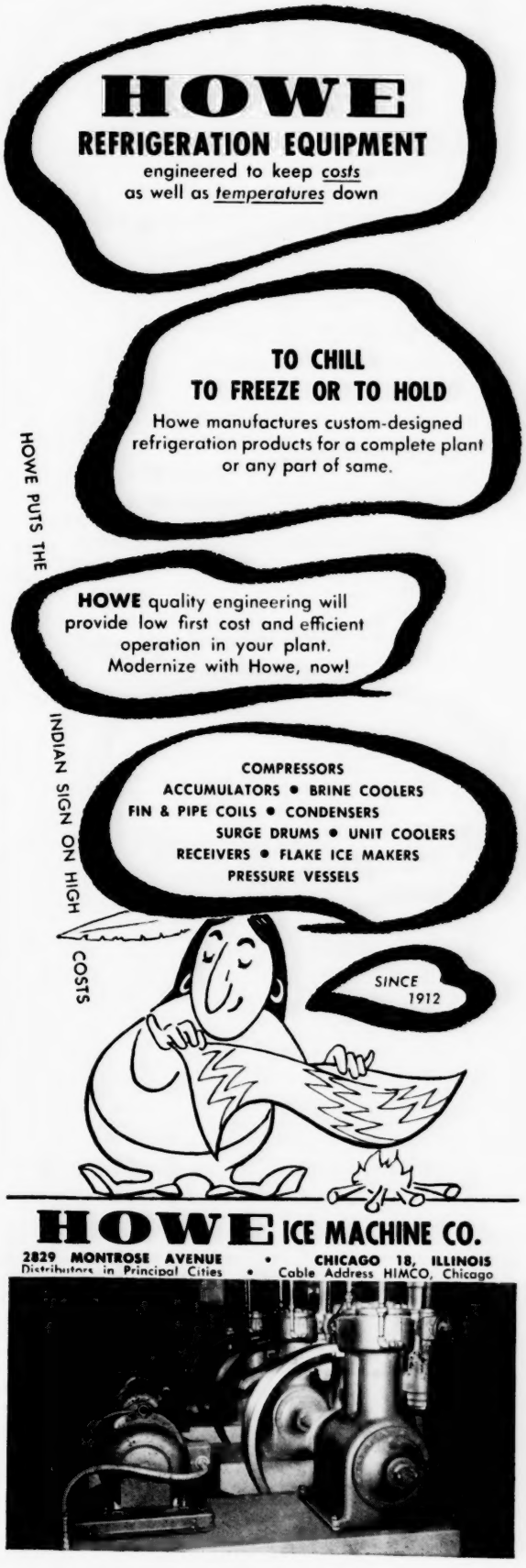
It is hinted that perhaps such research would show benefits which would make storages of certain valuable products attractive to warehousemen. (One month later a number of warehousemen at the NAPRE Regional Educational Conference at Benton Harbor, Michigan were raising the same query in the Question and Answer session.) The 1958 TRRF annual meeting did present Dr. A. E. Van Doren, State College of Washington on "Controlled Atmosphere Storage for Fruit".

Other Coverage

The April TRRF bulletin also reported on the availability of certain studies and publications. Among them were moisture condensation on cold storage military rations, food poisoning, reports 11 and 12 of T-T-T publications, papers on carrots, eggs, milk concentrates, frozen milk and cream, immersion freezing and vegetable seed storage.

Another recent technical publication, the Bulletin commented, is the first year's report on prevention of raw cotton yellowing through refrigeration. Although the study is scheduled for three years, the first year's reports were rather clear. Yellowing or deepening of normal yellow is a matter of importance in the quality of cotton. Moderate temperatures of 50 to 60 F accompanied by a low rh (50 percent or lower) appears to hold the color change to a satisfactory minimum for 2 to 3 years. Yellow-stained cotton brings approximately $50.00 less per bale. A detailed report is being published.

Under "Industry Notes", the Bulletin lists some changes in USDA Research Advisory Committee on Refrigerated and Frozen Foods, and lists the eight categories for new or expanded work at USDA activities or in cooperation with state stations. The bulletin also contained a short report on the Inter-Industry Task Group meeting in Chicago in March, and reviewed additional information available on the storage of asparagus root.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engineered to keep costs as well as temperatures down
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Howe manufactures custom-designed refrigeration products for a complete plant or any part of same.
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HOWE quality engineering will provide low first cost and efficient operation in your plant. Modernize with Howe, now!
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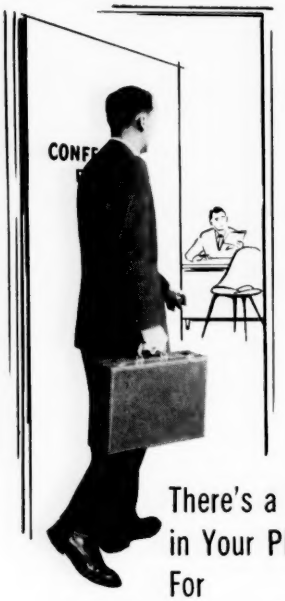

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Kohlenberger's extensive manufacturing facilities and experienced staff make it possible to offer industry a *complete* service in the development and installation of heavy duty industrial refrigeration and air conditioning equipment.

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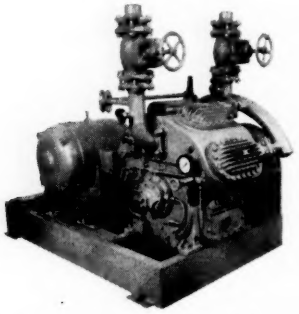

Kohlenberger heavy duty high speed industrial refrigeration compressor for ammonia and freon refrigerants.

Write for free illustrated brochure.

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1610 Commonwealth Avenue, Fullerton, California

—Courtesy, Canadian Dept. of Nat'l Defense.

Cut Me Off A Glass of Milk

STARTLING as it may sound, that is exactly what the headline read in the *Weyerhaeuser Magazine*. Although the above illustration and headline was staged as a gag at Ft. Churchill, Manitoba, milk is actually shipped to some of the outlying Canadian Department of National Defense bases in a frozen state. Frozen milk is not in a concentrated form but is, nevertheless, enjoyed by the Canadian armed forces, many days away from a fresh milk source.

Frozen Food Plants Busy

DURING the first week in May, the John Inglis Frozen Food Co. plant at Santa Maria, Calif. reported a record breaking 200 tons of brocoli had been processed. Plant Manager, Galen Hartwich expects the brocoli production to exceed 9 million pounds by August. Six million pounds of fordhook lima beans are anticipated as well as a million pounds each of cauliflower and string beans.

Truck Traps Its Driver

AN OPERATOR of a refrigerator truck in the San Francisco Bay area can thank a fellow driver for his complete recuperation after being locked in a compartment of his own vehicle. The victim had gotten too far into the compartment and the door blew shut with the wind. An alert buddy on the other truck spotted the vehicle after the victim had been reported missing. He drew the logical conclusion and rescued a very frost bitten, but much wiser operator.

Safeway Stores Add Another Center

BELLEVUE (Seattle) Washington is the site of still another Safeway Stores distribution center. Contracts for the center were awarded early in May. Nearly 500-hp connected compressor load will be required for the refrigerating plants. Both ammonia and halocarbon plants are used.

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Headered evaporator coil for liquid cooling or low temperature blast freezing. Also suitable for use with low temperature brine.

Rempe Coils are accepted in the industry as quality equipment that gives long service without maintenance. Over 50 years experience in the coiling and bending of pipe is your assurance of quality workmanship.

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NAPRE QUESTION BOX

HAVE A QUESTION? Address it to Prof. Harold P. Hayes, Dean of Engineering, State Polytechnic College, San Luis Obispo, Calif. Answers appear monthly in this department on problems forwarded by NAPRE members. Comments from all readers welcomed.

H. P. Hayes

Corrosion

QUESTION: What can be done to stop corrosion of an aluminum jacketing on our insulated lines? Insulation is Foamglas, but the corrugated jacketing was applied by the contractor using stainless steel bands. At first we believed the corrosion was due to the brine spray coils used in our cooler areas. However, in our freezer storage where we use dry coils the same effect takes place although at a slightly reduced rate. Where the band is applied seems to be the point of most rapid corrosion.—D.C., Dallas.

ANSWER: There is a distinct possibility that the excessive corrosion comes about from the galvanic action produced by dissimilar metals as the statement of the question would indicate. However, there is usually a heavier concentration of CO_2 within refrigeration plants than exists in a normal atmosphere. This would tend to corrode either aluminum or stainless steel as separate identities. Anodizing of aluminum retards corrosion but many operators have found that galvanized iron resists that type of corrosion best.

—J.H.H., San Luis Obispo, Calif.

High Super Heats

QUESTION: Our plant has experienced considerable difficulty with the compressors used on a portion of the plant where we take the direct suction on high temperature rooms located at some distances from the plant. High super heats are encountered with the discharge temperatures running as high as 325 to 350 F. Other compressors in the same plant which take suction from the flash tank run considerably cooler. No valve trouble or scoring is experienced with the latter compressors, while it is quite repetitious with the former. —L.J.V., Birmingham, Ala.

ANSWER: Most immediate and practical solution to this common problem is to inject liquid ammonia into the suction line at a convenient place, by some suitable means.

Excessively high superheat such as indicated is of no practical value. Although not increasing hp, the compressor does not handle as much gaseous refrigerant as at saturated conditions. Therefore the plant is less efficient[1]. And, more maintenance is encountered.

Coil starving, excessively long uninsulated suction lines, and other factors could be adding to this superheat problem. That entire portion of the system should be checked and operating conditions corrected. Consideration might be given to another suitably sized flash tank and a recirculation application such as indicated is used in another portion of the plant.—**J.H.H. & J.R.K.**

Refrigerant Decomposition

QUESTION: What is the critical point of ammonia? If L.J.V. above is operating at 350 F, is not his ammonia decomposing? Will the average purger remove sufficient quantities of inert gases which result when ammonia decomposes to prevent any disastrous consequences?

—F.G.L., Decatur, Ga.

ANSWER: Critical point of ammonia (NH_3) is 272 F. Temperatures of 1200 F and over are indicated as the range of "disastrous consequences" (see How Dangerous Is NH_3, page 4, May 1958 issue). Refrigerant grade ammonia is an unusually stable refrigerant. While it is possible for minute amounts of refrigerant to decompose, the purgers should easily handle this small quantity.

One would expect, however, that the temperature of 350 F would exceed the flash point of the lubricating oil. That would bring about the carboning of valves and lack of lubrication due to the volitizing of the oil. Valve and ring trouble with resultant cylinder scoring might be expected.—**J.H.H. & J.R.K.**

[1]See "Superheating" in Basic Refrigeration by Guy R. King, pages 15, 80, 332 and 334.

Brine "Cleaning"

QUESTION: Having always been an operator of direct expansion refrigerating plants of medium tonnage, and being on a new job, I was nonplussed the other day when my plant owner asked if I intended to "clean the brine system and restrengthen the brine for our coming busy season". How does one go about "cleaning" a brine system and where can you find literature on the maintenance of calcium brine?

—T.W.J., Dallas.

ANSWER: Brief RB-1 is a pamphlet describing the technique applied to cleaning of brine and strengthening same. It also offers methods of testing for ammonia leaks, for pH; covers the use of corrosion inhibitors; discusses how to correct acidity and alkalinity, and makes recommendations on storing calcium chloride.— **The Calcium Chloride Institute, Washington, D. C.**

Ice Rink Problem

QUESTION: Our open air ice skating rink located in one of the suburbs north of Chicago, is often affected by direct sunlight. One of our customers indicates that a Rocky Mountain rink uses a unique shading system. Can you tell us where we might learn of this? Is there any refrigerating practice we can use to offset softening of the ice on days of strong sunlight other than shading?—J.J.R., Chicago.

ANSWER: Cover illustration on July '54 INDUSTIAL REFRIGERATION shows a unique method of shading the outdoor rink at Denver Country Club. A description of the shade materials, placement and rigging, appears on page 22 of that issue. With regard to operating suggestions for offsetting softening of rink ice, they can possibly be made by your local NAPRE chapter educational committee. Present your problem with drawings of the system and your operating procedures. Better still, invite the committee to your plant.—**J.R.K.**

FOR MAKING GOOD ICE Templets REG. U. S. PAT. OFF. ARE SUPREME

TEMPLETS are not a new product . . . they have been on the market for almost a quarter of a century. Each year their popularity among ice manufacturers has become greater and greater. If you are an ice manufacturer and are unacquainted with TEMPLETS, may we suggest that you give them a trial at our expense—right in your own plant—and convince yourself of their goodness.

TEMPLETS come in the form of little green tablets. There is no extra work required in using them. Just drop two or three tablets into each can and that's all there is to it. The results will show up in your having a stronger ice cake that does not readily crack, break or chip. You will also have a clearer cake. TEMPLETS completely or partially eliminate white butts, heavy cores and cloudy veils. Your ice will have more "sales-appeal." TEMPLETS leave no taste, no odor, no color.

You will also find that by using TEMPLETS you can make more ice during the peak summer months in the same number of cans. Because TEMPLETS reduce cracking and breaking in the cakes, you can freeze raw water at lower brine temperatures, use the cans more often and make more ice.

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NEW QUESTIONS

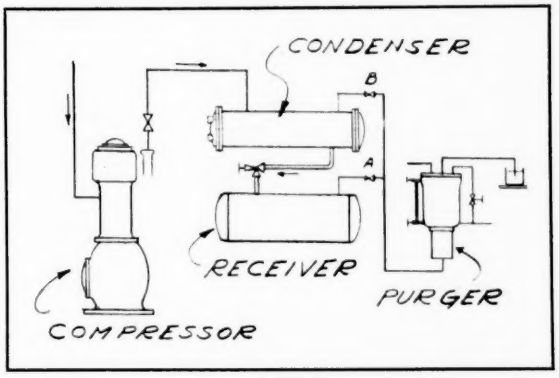
Slug Backs

QUESTION: What causes slug backs in an ammonia plant equipped with recirculating systems? Specifically this occurs when a sudden heat load is put in the cooler or freezer. Apparently more than enough ammonia is circulated to cause the liquid receiver to carry over, or to recycle the system, or in some cases to kick out the entire system when it is needed most.—F.D., Denver.

Correct Purging Point

QUESTION: When an automatic purger is used, is a purge connection from both the receiver and the condenser required? Or is the purge connection from the receiver only sufficient?

The following conditions are applicable:
(1) Only one condenser and one receiver are involved.
(2) The condenser is evaporative in one installation; shell and tube condenser supplied with water from an atmospheric cooling tower, in another.



Referring to the accompanying drawing, will purge connection "A" from the receiver give sufficient purging? Or, should purge connections be provided at "A" and "B", with purging being done either from the receiver or the condenser, as may be required?

—T.H.R.&D.D.W., Chicago

Oil in Evaporator

QUESTION: I am operating a Refrigeration-11 centrifugal compressor. I have added a lot of oil to maintain my oil level and I believe it is all going over and staying in the chilled water evaporator.

Is there any way to tell how much oil is in the liquid refrigerant in the evaporator?

What amount of oil will affect operating conditions?

How can I get this oil out of the evaporator?

—N.M.D., Chicago.

Air In System

QUESTION: What is the possibility of air entering a refrigerating system via venturi effect in high velocity suction lines operating at 15 psig; say through a cracked flange or a flared fitting?—B.H., Nojave, Calif.

Salt Water Ice

QUESTION: Where can I find data on salt water ice for fish preservation?—F.W.T., Pensacola.

Removing Oil From Aero-Sols

QUESTION: Aero-sol propellants received via rail car at our plant are discharged to storage by pressurizing the tank car (tankers have outlets similar to refrigerant receivers). We employ a Brunner compressor, 4-cyl. Model NR-10 (V type, 3-5/8 x 2-1/2-in) W56-1 operating at approximately 420 rpm. This unit taking suction from our storage tank, discharges through an oil separator and into the tank car at from 50 to 70 spig.

Our problem is this: The supplier contends that we are contaminating the tank car with refrigerant oil and he is back-charging us for cleaning. Our oil separator has no name plate data on it so we do not know the particulars other than it has a 1-5/8-in. OD inlet and outlet, etc. However, we believe that the separator is probably too small or its structure is ineffective. Where can we find literature that would describe the most effective way of removing oil from the compressed aero-sols? They are mostly Refrigerant-12, and combinations of halocarbon gases involving Refrigerant-12. Is there any literature that specifies size and internal arrangements for oil separator vessels?—C.W., Chgo., Ill.

String Bean Refrigeration

QUESTION: Kentucky Wonder Beans available in a growing area in Mexico, some 300 miles below Nogales, are transported into Los Angeles market by iced trucks. However, they are delicate to handle and quite frequently develop rust spots. Would vacuum cooling and subsequent bunker icing be a better refrigerated preservation method?—J.L.D., Los Angeles.

Hidden Mirrors

QUESTION: Insulation recently applied to an addition to my cold storage plant went over sheets of aluminum for exterior walls and under similar sheets for the roof. I applied the aluminum foil not only for its vapor barrier values but for reflective characteristics as well.

Later when I built a new home I tried to persuade my contractor to do the same. He argued that this practice had very little value in home construction and quoted me an exorbitant price when I asked him to investigate. Yielding to expediency at the time it was omitted. I have since felt I should have put time and effort into placement of aluminum foil or reflective surface between interior finishes and the fibrous insulation materials. Do you agree?—B.C.M., Toledo.

Reflective Insulation

QUESTION: Insulation recently applied to an addition to my cold storage plant went over sheets of aluminum for exterior walls and under similar sheets for the roof. I applied the aluminum foil not only for its vapor barrier values but for reflective characteristics as well.

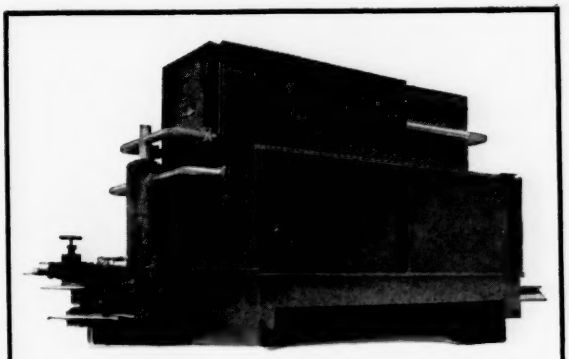
Later when I built a new home I tried to persuade my contractor to do the same. He argued that this practice had very little value in home construction and quoted me an exorbitant price when I asked him to investigate. Yielding to an expediency at the time, I have since felt that perhaps I should have put the time and effort into placement of aluminum foil or reflective surface inside my fibrous insulation materials in my new home.

—B.C.M., Toledo.

Soldering Practices

QUESTION: What type material is recommended for soldering aluminum to aluminum, and for soldering aluminum to copper?—M.S., Jackson, Miss.

(Continued on Page 42)



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- **Because you save 95% of cooling water cost.**

You save labor in upkeep. With full access to all parts and interior piping you see everything in easy inspections. You head off dirt accumulation and corrosion. Casing panels are removable without moving the coils. The coils can be cleaned from both sides.

First cost is low; freight is low because of the lowest space/weight ratio; you save much labor in erection. Capacity range is 90 to 240 tons. No other condensing method gives you so much saving in money and trouble.

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What's New

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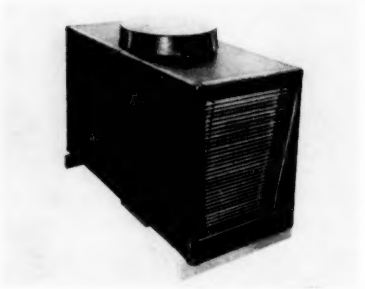
Plastics For Towers and Evaporative Surfaces

Deterioration-Free Cooling

▶▶ POLYETHYLENE and polystyrene plastics have shown remarkable resistence to chemical attack and decay usually found in packings for cooling towers. Plastic coatings have also shown promise as corrosion protection. Recently the Design Engineering Show held in Chicago presented a citation to Fluor Products Co. for best use of such materials in product design.

Poly-Grid packing was perfected by the Whittier, Calif. firm's research engineers. The firm entered into an agreement for production of two standard size grids with the Plastic Division of GATX, E. Chicago, Ind.

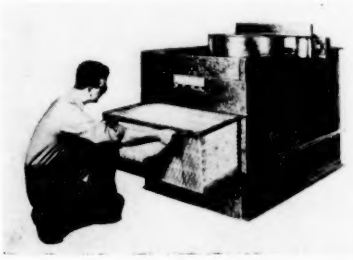


Inerts Protect Wood Towers

▶▶ AT KANSAS CITY, another well known line has incorporated various plastics in the construction of Permatowers using reinforced polyesters, phenolic and kralastic resin and resin-protected laminates. Permatowers are built on the performance proved Aquatower design. Use of inert protective materials is even extended to the water distribution system which incorporates molded kralastic type resin riser, header and distribution manifolds. Bulletin PT-58 covers 11 models of these induced-draft towers.

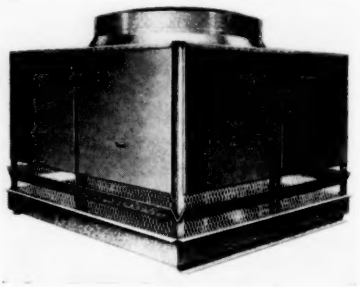
Also Uses Plastic Decking

▶▶ BACK IN CHICAGO, still another firm has developed a new compact general purpose tower constructed in part of non-corrosive plastic. Notched plastic sheets provide four times as much water to air exposure as conventional decking. Multiple plastic decks are mounted in easily removed drawers at each end of the tower. Balance of the tower is hot dipped galvanized steel.



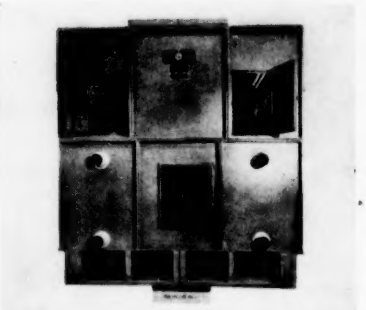
Color and Display Features

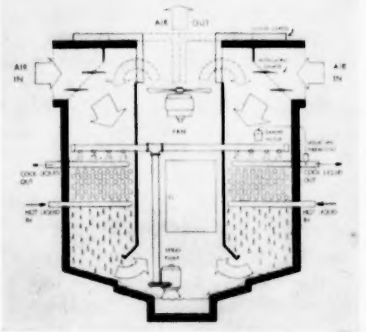
▶▶ AN INDEPENDENCE, Missouri, firm announced the availability of a "silLOWette" package tower up to 150 tons. Unique features in addition to the low design, are colored panels of cement asbestos. Translucent side panels are available and permit interior lighting of the tower for attractive display purposes where the apparatus cannot be concealed.



Mass. Firm Enters Field

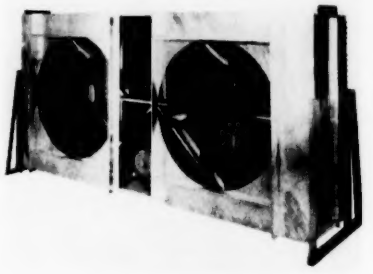
▶▶ FABRICATED of fully reinforced heavy gauge steel, a new line of induced-draft water towers for commercial and industrial use has been introduced by a Massachusetts firm. Standard coating of this Hydra-Glide line is a long lasting plastic. Stainless steel is used for the fan shaft, overflow and drain fittings. Another feature is compact design.





New Models by Niagara

▶▶ WINTER-SUMMER models of sectional Aero Heat Exchangers have been introduced by Niagara Blower Co. Operation is completely protected from freezing in extreme winter climates. Unit water cooling capacity in these machines range up to 18 million Btu/hr. Applications are to all industrial fluid cooling systems, liquids and air and gases, cooling systems and temperature control of chemical processes.



Air-Condensing Expands

▶▶ DRICON air cooled condensers are now available in 30 and 40 TR respectively. The Recold line has been expanded to include these two larger size units. Used particularly for large applications where water is not accessible, the Dricon DC-30 and DC-40 can be grouped in multiples for use in exceptionally big installations. A balanced circuiting is said to greatly increase the efficiency of the condenser. See Cat. 34CBa.

BASIC REFRIGERATION

By Guy R. King

The Book

of

"Refrigeration Knowledge"

29 Chapters—340 ILLUSTRATIONS—526 PAGES COVERING THESE SUBJECTS

- Fundamentals
- Compression System of Refrigeration
- Refrigeration
- Expansion Valves
- Evaporators
- Compressors
- Condensors
- Flow Equipment
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- Lubrication
- Defrosting Methods
- Compressor Drives
- Food Preservation
- Operating
- Servicing
- Refrigerated Enclosures
- Instruments and Meters
- Heat Calculations
- Humidity in Refrigeration
- Compressor Calculations I
- Compressor Calculations II
- Refrigerant Lines—Pressure Drops
- Brine in Refrigeration
- Liquid Cooling
- Complete Systems
- Carbon Dioxide—Dry Ice
- Altitude and Its Effect
- Absorption Systems
- The Refrigeration Code

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New! Low Temperature Freezer

MINUS 120° F TO PLUS 300° F

- Serves many needs:—Laboratory Control, Industrial Research and Production.
- For Cold Treating, Stabilizing, Environmental Testing, Low temperature storage of metals, Rivet cooling, Shrink fitting, Gage seasoning, Steel hardening and Metallurgy.

invaluable in the field of GUIDED MISSILES and ROCKETRY

Standard production model, (white) self-contained, including automatic controls.

34" high—28" deep—38" wide—outside dimensions.

Complies with National B-9 Refrigeration Code.

New low price—immediate delivery (available without automatic controls, for Dry Ice Storage).

Alpha Electric Refrigeration Co.

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SHANK AMMONIA VALVES

Well Engineered—Precision Built—

ALL-STEEL GAUGE SETS with automatic shut-off of liquid in case of glass breakage.

RELIEF VALVES for Ammonia and Freon. Positive relief action. Pressures from 75 to 300 lbs.

Largest line of Ammonia All-Steel Bar Stock Valves in the industry. Completely Cadmium plated.

Shank Ammonia Valves have good basic designs that provide extreme soundness of composition in packing rings that provide a long life — a leak seal

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HENRY BOWER CHEMICAL MANUFACTURING COMPANY

29TH AND GRAY'S FERRY ROAD

PHILADELPHIA 46, PA.

Six King Sharp Freeze units have been installed at Carnation's milk and ice cream processing plant in Seattle, Washington.

King systems feature fast, economical, simple air defrost . . . each unit is defrosted once or twice a week . . . 20 to 30 minutes defrosting time required. King Sharp Freezing Systems are designed to maintain maximum capacity during the entire interval between defrosting periods . . . thus no reduced capacity from heavily frosted coils.

7500 square foot hardening room has King Sharp Freeze units located on one side of the room with a specially designed air distribution system.

Write today for further information.
Manufacturers of sharp freeze, cooling, ventilating and heating systems
King COMPANY OF OWATONNA
907 No. Cedar St. • Owatonna, Minn.

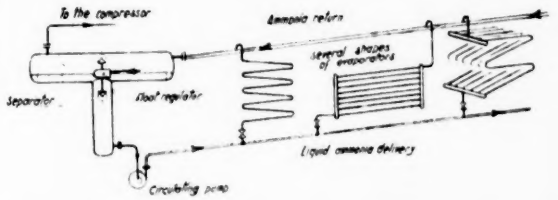
Question Box . . . . continued

Recirculation System Fails Marine Application

QUESTION: We see that under the Question Box there are replies to technical questions given by the readers. We should much appreciate a detailed report as to the following:

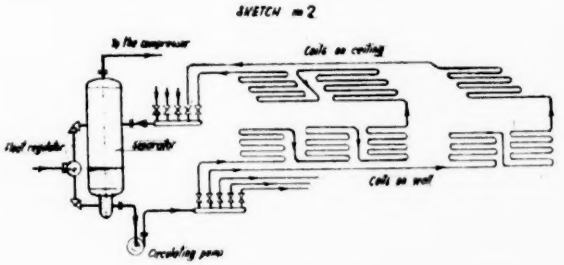
In the plants with ammonia circulation by means of a circulating pump we frequently let the ammonia circulate to the evaporators supplying same in the under part in order to discharge gas from the upper part. The supply pipe coming from the pump rises possibly in continuous pendence to the evaporators, the supply to the evaporators is parallel and the return pipe to the separator goes in continuous inclination to same (see Sketch No. 1).

SKETCH no 1



In a plant on a ship we placed the evaporators, formed by 3/4" smooth pipe coils, in groups of coils conected in series on each supply of ammonia brought to the circulating pump; ammonia goes back to the separator through a 1-in. pipe. Evaporating temperature is minus 30° C.

SKETCH no 2



We saw in this plant that ammonia returns almost suddenly back in big quantity to the liquid separator and fills it, keeping thus closed the float regulator for 40 or 50 minutes, while, when the float regulator opens itself, remains open for 50 minutes more; operation goes on in this way, filling and emptying in the same time also the liquid receiver of the condenser.

Please note that the pump, for space exigencies, is placed just under the separator, and thus with scarce liquid column on the suction side. We think that intermittence on return of liquid is due to the fact that as the coils are in a group in series and because of the ship's undulation which disposes the pipes alternatively with opposite inclinations, ammonia steam in the pipes pushes forward the liquid almost as long as it is exhausted, favored by successive dip pipes formed by the curves.

Now, before the above mentioned phenomenon can begin again, the coils, almost empty of liquid, must charge themselves again with ammonia and when same is sufficient to act as hydraulic valve on the dip pipes on the curves, back-water on the separator begins once more. The inconvenience can be favored by the momen-

tary reduced efficiency of the pump. The float regulator undergoes to these level fluctuations and so it remains long closed or open.

We should like to take, in order of importance, the following remedies:

1) To place a second pump for liquid ammonia circulators on an almost inferior altitude as the present pump, in order to make sure and intensify ammonia circulation in the coils.

2) To connect the vertically disposed wall coils in branch instead of in series, on the pump's liquid ammonia distribution.

3) To substitute the mechanical float regulator on the separator with an electric floater having a solenoid valve, in order to supply again more promptly the liquid when the level in the boiler is going to remain insufficient for a long time and keeps the regulator open.

We shall be grateful to you if you will arrange for giving us an answer to the following questions:

a) Are you already acquainted with such troubles?

b) Do you agree with the explanation we gave about the phenomenon?

c) Do you think our remedies will be sufficient to eliminate the inconvenience and which one do you think is the best?—G.D'O., Milan, Italy.

COMING CONVENTIONS

NATIONAL SOCIETY OF PROFESSIONAL ENGINEERS
June 11-14, 1958
Chase-Park Plaza Hotels, St. Louis, Mo.
Kenneth E. Trombley, Public Relations

AMERICAN SOCIETY OF HEATING & AIR CONDITIONING ENGINEERS
June 23-25, 1958
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W. M. Vidulich, Public Relations

AMERICAN SOCIETY OF REFRIGERATING ENGINEERS
June 23-25, 1958
Leamington Hotel, Minneapolis
R. C. Cross, Executive Secretary

CANADIAN ASSOCIATION OF ICE INDUSTRIES
October 6, 7, 8, 1958
The Chantecler, Ste. Adele, Quebec
Mrs. Mildred E. Croft, Executive Secretary

NATIONAL ASSOCIATION PRACTICAL REFRIGERATING ENGINEERS
November 11-13, 1958
Kenilworth Hotel, Bal Harbour, Fla.
Charles W. Moneypenny, Chairman.

NATIONAL ASSOCIATION OF ICE INDUSTRIES
November 18-21, 1958
Biscayne Terrace and Everglades Hotel, Miami Beach, Fla.
Wm. T. Jobe, Executive Vice-president

INTERNATIONAL HEATING AND AIR CONDITIONING EXPOSITION
January 26-29, 1959
Convention Hall, Philadelphia
E. K. Stevens, Manager

THE REFRIGERATION RESEARCH FOUNDATION
April 2-5, 1959
Statler and Mayflower Hotels, Washington, D.C.

NATIONAL ASSOCIATION OF REFRIGERATED WAREHOUSES
April 5-9, 1959
Statler and Mayflower Hotels
Washington, D.C.

NATIONAL EXPOSITION OF POWER AND MECHANICAL ENGINEERING
December 1-5, 1958
New York Coliseum, New York, N.Y.
E. K. Stevens, Manager

DAIRY & ICE CREAM INDUSTRY EXPOSITION
December 7-13, 1958
Navy Pier, Chicago, Ill.

INTERNATIONAL ASSOCIATION OF ICE CREAM MANUFACTURERS
NATIONAL ASSOCIATION OF RETAIL ICE CREAM MANUFCTURERS
Conrad Hilton Hotel, Chicago, Ill.

DAIRY INDUSTRIES SUPPLY ASSOCIATION
Congress Hotel, Chicago, Ill.

MILK INDUSTRY FOUNDATION
Hotel Sherman, Chicago, Ill.

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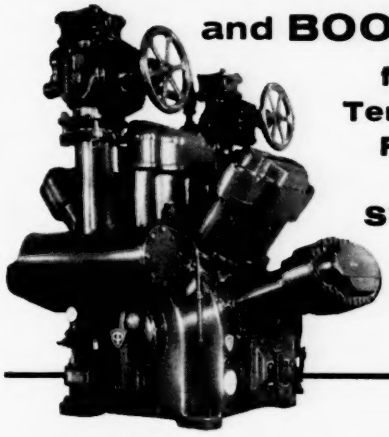
REFRIGERATION PROBLEM?

☐ LACK OF CAPACITY? ☐ EXCESSIVE MAINTENANCE?
☐ SPACE? ☐ OBSOLESCENCE?
☐ HIGH OPERATING COSTS? ☐ NEW PLANT?

Investigate type "K"

COMPRESSORS and BOOSTERS



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WHETHER the most economical answer is one of the latest model CP Type "K" Compressors —a two-stage Booster-Compressor System—or a complete new refrigeration layout—you'll find a full range of capacities and models that lets you match the equipment to the job exactly. You'll get the long-term economy, solid dependability and sound engineering for which CP Compressors and Boosters are famous.

WHAT'S MORE, you'll get the extra benefits of CP "Job Engineering"—the advanced "know-how" that CP Engineering has been developing and applying for generations. It costs no more—but it can save you a lot! Write—tell us your problems—let us help you with a solution.

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THE MARK OF DISTINCTION IN REFRIGERATION EQUIPMENT

Refrigeration People In The News :

Bell Becomes Consultant

M. E. Bell

HANGING out his professional shingle is Mortimer E. Bell, most recently Supervising Engineer for Sick's Enterprises, Seattle. Bell, Chairman of the Board, NAPRE, has formed Mortimer E. Bell & Associates, Registered Professional Engineers, 2404 So. Baldwin Ave., Arcadia, Calif. The firm will undertake all types of engineering and construction work in the beverage, food processing and air conditioning fields where refrigeration, materials handling and power applications are involved.

Experienced in electrical engineering and construction, Bell has also served railroading, milk and ice cream industries and the brewing field as a refrigeration engineer. Migrating from Virginia to California for Caterpillar Tractor Co., he changed from internal combustion experience to electrical applications for Union Construction Co. at Oakland. Next, he was employed by the Santa Fe Railroad as a refrigeration engineer.

Leaving Santa Fe in 1924, Bell became Chief Engineer of the National Ice Cream Co. which is today the Golden State Division of Foremost Dairies, Inc. In 1936, he located with Los Angeles Brewing Co. (now Pabst) until 1949 when he became Supervising Engineer for Sick's brewing organization. He was responsible for design and construction of Sick's new brewery in Vancouver, B. C. as well as an extensive program of expansion and rebuilding of the firm's for other United States and Candian breweries. His profession was interrupted during World War II when Bell became Planning Engineer Officer for the Navy repair facilities in the 10th Naval District, San Juan, Puerto Rico.

Williams to Head Poultry Industries

H. M. Williams

NAMED to succeed Dr. Cliff D. Carpenter as President of the Institute of American Poultry Industries, effective July 1, 1958, is Harold M. Williams, Chicago. The announcement was made by William F. Leimert, Chairman of the Board, IAPI, on March 21. Williams had previously been a director of Fox DeLuxe Foods, Inc. and other meat and poultry packing enterprises, Chicago. Dr. Carpenter, who has been executive head of the Institute since 1944, last Fall asked the board of directors to relieve him. However, he will continue to serve the Institute in a more specialized capacity.

Recold Continues Growth Promotes and Adds to Staff

Early in the year, Walter E. Hilton was named as Western Sales Manager of Recold Corp. by Hy. T. Jarvis, President. Hilton is a 22-year veteran in refrigerating and air conditioning, being formerly associated with Thermal Products, Inc., Los Angeles. A member of ASRE and NAPRE, Hilton will have sales responsibility for the eleven Western states, plus Western Canada, Texas and Oklahoma.

In the Engineering Department, Dan D. Wile, Vice President, announced the promotion of S. Robert Adachi to the position of Chief Engineer of Refrigeration Products. Adachi had been Laboratory Engineer for Recold and is a graduate of the University of California.

The new manager of the Development Laboratory for Recold is David S. Brainard. Brainard had been associated with Recold in the Development Laboratory. Prior, he had been employed by Southern California Gas Co. as a design engineer. As Associate member of ASRE, he is a graduate of California State Polytechnic College, Refrigeration and Air Conditioning School.

S. R. Adachi

A. S. Brainard

Jarvis Attempts World Girdling in Sixty Days

Al Rebel & "Hy" T. Jarvis

Recold's President, H. T. (Hy) Jarvis and Albert Rebel, President, Recold International embarked on a 60-day around the world trip, April 1st. They are to visit Recold distributors in 17 foreign countries as well as open up several new marketing areas. Some of their stops off the normal tourist track will be: Pakistan, Iraq, Thailand, Iran and Lebanon. This trip will be Mr. Jarvis' first visit to A/S Atlas Maskinfabrik in Copenhagen. This Danish firm has been manufacturing RECOLD equipment for the Scandanavian countries since July of 1952.

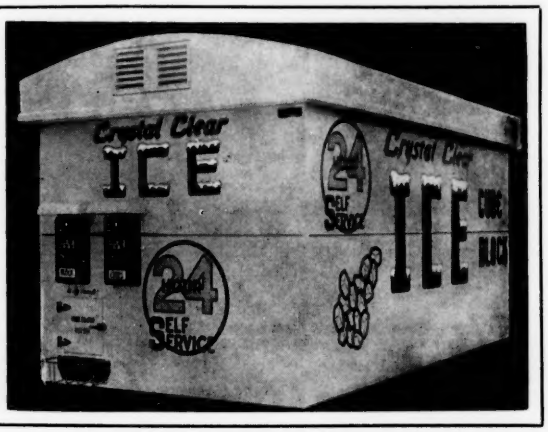
K. G. BROWN INTRODUCES THE NEW MULTI SCREW VENDOR FOR 1958

- **An increased capacity of 40% over previous models.**
- **Multi Single Line Vending of any size package or block, regardless of the type of tie.**
- **These new vendors are now made in lengths up to 20' which will vend 268 10# bags plus 132-25# blocks out of the same delivery door, (400 Sales).**
- **Up to 5 various sizes of blocks or bags can be vended from this one vendor.**
- **Radical invention, trouble free, more storage space by design, lower operational cost.**

NEW LOW COST 6' x 8' station vends 110-10# packages, or the "Junior", 3' x 7' station vends 90-10# packages using the new multi screw vendor.

ILLUSTRATED
9' x 16' Station vends 168-10# bags and 86-25# block.

K. G. BROWN MFG. CO., INC., MATTITUCK, N. Y.



Marine Engineer Builds Water Cooling Towers

P. H. Mason

HEADING up a new company which will design and produce water cooling towers is Paul H. Mason. President of the firm, Mason is a registered professional engineer and formerly sales manager for the Phillips Cooling Tower Co., Brooklyn. A graduate of the University of New Hampshire and the U. S. Merchant Marine Academy, he is a native New Englander. A member of ASHAE, he received an initial experience from the field with Foster Wheeler Corp. as a mechanical engineer. The firm, Mason Products, Inc. will maintain general offices in West Concord, Mass. and will specialize in commercial and industrial tower production.

STUART W. BROWN has been named head of Swift & Company's frozen food department to succeed M. A. Cox who becomes a member of the company's general sales department.

PAUL VOLLMER, vice-president, celebrates the Golden Anniversary this year —50 years of loyal service at Produce Terminal Cold Storage Co., Chicago.

US Cold Storage Promotions

FOLLOWING the annual meeting of stockholders of United States Cold Storage Corp., April 22 in Chicago, at which all directors and officers were reelected, President Earle E. Hesse announced the following promotions and additions in personnel in the cold storage organization and its subsidiaries.

Ralph T. Mackenzie has been promoted to the Chicago office to coordinate sales of the cold storage activities. He has heretofore been vice president in charge of the Texas division and will continue to exercise supervision of the Texas operations.

James A. McIlrath has been appointed operations manager as assistant to R. M. Conner, vice president in charge. Jim was previously assistant vice president-engineering. W. F. "Will" Holmstrom formerly with the public relations department of the Bowman Dairy Company, has taken the place of Jerry Tiemann in the sales department as Jerry transfers to Kansas City, where he has been appointed sales manager. D. T. "Don" Estrem of Excelsior, Minnesota, will represent the organization in sales and solicitation in Wisconsin and Minnesota.

L. C. Britt, formerly office manager and assistant treasurer at Dallas, has been promoted to assistant manager of the Dallas plant. Dale D. McCutchen, formerly plant superintendent at Dallas, has been promoted to assistant manager at the Ft. Worth plant.

Gavin ADL Administrator

Gen. J. M. Gavin

ELECTION of James M. Gavin as Vice President and Director of Arthur D. Little, Inc. was announced in April. General Gavin will assume his duties as Administrative Officer on June 1st at Acorn Park, ADL Research Center, West Cambridge, Mass. ADL is an industrial research organization operating laboratories in Cambridge, Chicago, San Francisco, New York, D. of C. and Puerto Rico.

VAN RENSSELAER H. GREENE

ENGINEERS

COMPLETE PLANT DESIGNS INCLUDING BUILDING AND EQUIPMENT

11 PARK PLACE NEW YORK 7, N. Y.

Classified Advertising

All classified advertisements are payable in advance. Except for Positions and Help Wanted classifications, this section is reserved exclusively for USED equipment.

RATES: 20c per word; minimum 25 words. $2.00 per line for bold face headings: $15.00 per inch for line listings.

USED EQUIPMENT—wanted & for sale

FOR SALE — Refrigeration equipment; ice equipment; new, used. Advise us your needs. Use **"QUICKSEAL"** — stops brine tank leaks; easy, efficient, economical. Born Company, 80 East Jackson Boulevard, Chicago 4, Illinois. WAbash 2-3299

FOR SALE

Steam mixed pressure bleeder turbine with condenser; Terry turbine type GZF8 1949 rated 800 h.p. at 4100 r.p.m. with 140#-30#-20" vacuum. Worthington surface condenser for above turbine 1010 sq. ft. in Admirality tubes, over all size 39½" x 14'2". Turbine driven York VW ammonia compressors consisting of 400 h.p. DeLaval steam turbine type MCA and DeLaval direct connected gear reducing unit on common bed plate. 4540/720 r.p.m. with rubber shear couplings driving two York 6¾ x 5 eight cylinder ammonia compressors, complete with ammonia oil separators and oil return traps, plus ample spare parts and panel board with automatic air controlled system. Original installation June 1951. Compressors rated 250 tons ammonia. Over all floor space 71½' x 20'. Can be seen in place at:

P. BALLANTINE & SONS
57 Freeman St. Newark 1, N. J.

FREE CATALOG — Write for 16-page, two color illustrated catalog, showing ammonia compressors, condensers, room blowers or coolers, etc., for sale. Immediate delivery; tremendous bargains. Most equipment still erected. Chas. S. Jacobowitz Corp., 3080 Main St., Buffalo 14, N.Y. Telephone AMherst 2100.

FOR SALE — 9 x 9 Frick ammonia compressor, direct connected to 75 h.p. 257 r.p.m., 4000 volt synchronous motor with starting equipment. The Crystal Ice & Cold Storage Co., 221 S. Leighton St., Kenton, Ohio.

WANTED — Highest cash price paid for late model equipment including complete plants, individual compressors, condensers, receivers, diffusers, etc Our export buyers are here now, looking for good equipment, so give complete details including location, age serial number, asking prices, and if possible, photographs in first letter. Address Box JU-4 % Industrial Refrigeration.

FOR SALE — Carrier 10 ton unit; new; water cooled; F-12, direct drive; has starter and water valve; MO 5K324D180; $750. Carrier 10 & 15 ton water cooled condensers; new; with ASME stamp; $200. each; has own base for remote mount. Carrier blast freezer tower; MO15T2-199; $250 Northland Refrigeration Sales Co., 1823-25 S. Kedzie Ave., Chicago 23, Ill.

FOR QUICK SALE — Complete refrigeration system, capable 850 ton ice or 1700 ton refrigeration, consisting of 5 (duplex) Worthington ammonia compressors, each (duplex) with one 600 h.p. motor, exciters, transformers, condensers, receivers, purgers, cooling towers, tower pumps, traps, etc. Over $750,000 value new; good condition; daily operation, engineer maintenance. Attractively priced slightly under $200,000 f.o.b. flat cars, Middle West. Pictures, details available Inspection can be arranged. Born Company, 80 East Jackson Blvd., Chicago 4, Ill. WAbash 2-3299.

WANTED — Ammonia receiver to hold 350 lbs. Battle Creek Cooperative Creamery, Battle Creek, Nebraska.

WANTED — Up to 400 11½ x 22½ x 58" 400 lb. ice cans in good condition Write Duty Ice Co, 724 S. High St., Akron 11, Ohio.

WANTED — Ammonia brine cooler, 36" x 16' in good condition. The Crystal Ice & Cold Storage Co. 221 S. Leighton St., Kenton, O.

FOR SALE — 4 x 4 Frick; 4 x 4 York; 8 x 8 York, $350.00. 20" x 10 ft. receiver. Valves, 1/2 price. Write E. Niebling, 1546 St. Clair Ave., Mt. Healthy, Cincinnati 31, Ohio.

FOR SALE — Low temperature "Freon" 22 system consisting of 3 Niagara Model 660 air units with concentrators and a General Electric 8 cylinder 50 h.p. 220/440 volt, 3 phase, 60 cycle condensing unit. Excellent condition; reasonably priced. Write or phone Star Cold Storage Corp, 96 North 6th St., Brooklyn 11, N.Y. STagg 2-3900.

FOR SALE

9 x 9 York, 360 r.p.m., 100 h.p.
9 x 9 York duplex Model D8, 360 r.p.m., 200 h.p.
8 x 8 Frick V-belt drive 60 h.p.
5 x 5 Frick w/evaporative condenser.
4 cyl. Carrier type 7G8 60 h.p.
(4) Carrier cold defusers, floor mounted, 3 h.p. each.
300 h.p. Westinghouse starter 4160 volts (new).

John F. Carson
A & Venango Sts., Philadelphia 34, Pa.
GArfield 6-2221

BUSINESS OPPORTUNITY

FOR SALE — ICE COMPANY OPERATION (6 outlets) South Central Georgia. All excellent locations with steady accounts. Complete equipment and flash freeze, process, and storage rooms for meats and fruits. Ice vending machines; truck ice; rail-side. Frick compressors. Ref. 8975. Business Mart of America, 5723 Melrose Ave., Los Angeles 38, Calif.

Ice Cream Freezer Operation Techniques

MECHANICAL aspects of continuous ice cream freezing are only half the problem of achieving maximum production capacity, according to Virgil Lickteig, Bowman Dairy Company, Chicago. Lickteig addressed the attendants at the Farm and Home Week held early in 1958 at the University of Wisconsin College of Agriculture, Madison. This freezerman reversed the usual procedure of operator blaming the machine manufacturer.

To get the most from the continuous freezing, Lickteig pointed out there must be adequate refrigeration and the machine must be in good operating condition. He specified that the freezers should be purged of oil daily. Blades should be sharpened frequently.

Most important, however, the speaker pointed out, was personnel; a freezer man who is alert, who understands the mechanical operation of the machine, who knows what can and cannot be done to prevent unnecessary and costly shut-downs.

Homogenization of the mix and mix formulation are next important, as are mix temperatures in order to get much volume from the freezer. Flavor scheduling also plays an important part in production. The freezerman or production manager can control the latter items.

More Food Irradiation

STANFORD Research Institute in its annual News Bulletin "Research for Industry", featured a page and a half article on preserving foods by irradiation. The Institute, located at Menlo Park, California, has recently been asked by the U. S. Army Quartermaster Corps to determine whether the proposed high-intensity radiation source would produce an effect similar to those resulting from the low-intensity experiments.

Ten samples of unseasoned perishable foods such as fish, beef, fresh peas and string beans, strawberries and powdered milk were irradiated. Results indicate that high-intensity electron beam produced effects on the foods, bacteria, and nutrients tested only slightly different from those caused by the low-intensity gamma rays. Difference in the flavor and odor of foods irradiated by the two sources were noted by some taste-testers, but the number of differences observed was too small to be considered statistically significant.

Fruit Processing Plant Sold

SALE of the Yakima Fruit Growers Association (Big Y) fruit processing plant in Sunnyside, Wash. to Mojonnier & Sons, Walla Walla, was announced by Paul Van Wormer, assistant manager. Decreasing Lower Valley apple acreage and modern hauling techniques prompted the sale, Van Wormer said. Big Y will consolidate its Prosser-Grandview-Sunnyside processing in the Grandview plant.

Van Wormer said the Lower Valley once outproduced the Upper Valley but since has turned to other types of farming at the expense of fruit. Mojonnier & Son expects to emphasize asparagus and vegetable processing. Big Y will continue to operate fruit processing plants in Kennewick, Benton City, Grandview, Sawyer, Wapato and its several Upper Valley locations. Mojonnier & Son has operations in Walla Walla and Milton-Freewater, Ore.

New Storage Plant For Nova Scotia

A PUBLIC cold storage plant will be built in Liverpool, Nova Scotia. The projected plant will receive a one-third federal subsidy, plus a loan of 50 percent of the cost of the freezer from the province. Under the regulations, no individual or private firm can own more than half of the shares of the cold storage plant. They will be sold to fishermen or other local businessmen.

A new fish processing plant will also be built, in a separate building and privately owned by Nickerson Brothers, Ltd. The public freezer will have a capacity of 1.2 million lb. Cost: about $250,000.

Mink Feed Company Installs Freezer

A NEW freezer has been installed by Heger Products Company, St. Paul, Minn., which will increase cold storage capacity to 900 tons. The company uses the refrigerated space for storing mink feed of which it sells almost a million dollars

The Heger Company provides truck delivery service to most parts of Minnesota, Iowa and Wisconsin, and 13 other midwestern states and Canada. The company was started in 1926 by Robert H. and William F. Heger who operated several pet shops in St. Paul. It was founded to produce foods for dogs, fish and birds principally, but the hungry mink took over the entire production by 1951.

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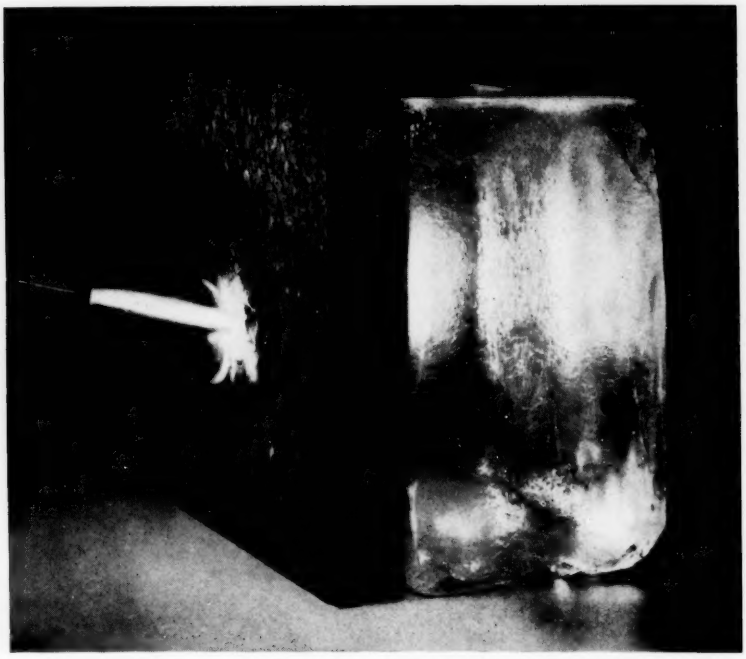

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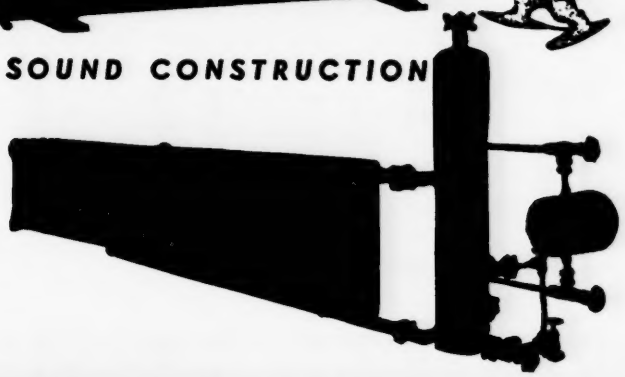

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